AMERICAN MACHINIST

A PRACTICAL JOURNAL OF MACHINE CONSTRUCTION

ISSUED WEEKLY

VOLUME XXIX—PART TWO.

July 1 to December 31, 1906.

PUBLIC LIBRARY
MAR 21 1907

Hill Publishing Co.,
505 PEARL STREET,
NEW YORK.

6205
v.29 pt.2

AMERICAN MACHINIST

INDEX FOR VOLUME 29, 1906—Part TWO.

Explanatory Note.

Illustrated articles are marked with an asterisk (*). Book notices are marked with a dagger (†). Cross references to a particular initial word generally refer to any cognate work beginning in the same way. Thus, a reference from "Caliper" to "Gage" would apply equally to "Gages," "Gaging," etc. The cross references are intended to condense the matter and assist the reader, but are not to be regarded as completely inclusive, exclusive or conclusive. So, if there were a reference from "Pattern" to "Foundry," and if the searcher failed to find the sought-for article under the latter entry, he should not regard it as useless to turn back and look through all the "Pattern" entries, or others that the topic may suggest, as he would have done had there been no cross reference.

A

PAGE

Abbreviations, General Electric Co.'s drawing-office. *795
Accident. See also "Law."
Accident concealed—Unjust claims on builders. 756
Accident, Fatal—Suffocation in pit. 246
Accidents—Evils and restrictions of carelessness. 828
Accidents in Russian shops—Compensation. 659
Accidents, Shop. 34
L. L. Arnold. *186
Accounting, Tool Builders discuss cost. 522
Accounting—Economy in shop management. 627
Accounting system, Le Blond. W. T. Harris. *312
Accounting, Time and cost—Taylor system. *761
Acme Machinery Co. shop notes. 17
Addition of binary fractions. G. Schneider. 82
Addition, etc., on calculating machine. *555
Adjuster, Hamilton's engine erector's line *662
"Adriatic," Engines for the. 186
Advertising, International Correspondence Schools'. 584, 588
Advertisements, Financial-assistance. Entropy. 748
Aging ivory and pottery. 882
Agricultural machinery establishments, Russian. 603
Air and other gases, with special reference to small pressure differences, Flow of. S. A. Moss. *368, 407
Air at Presall, Lancas., Raising water by compressed—Union Alkali Co.'s works. James Kelly. *203
Air blast, Disposing of punch-press scrap with. *315
Air brake on boring mill. *160
Air compressor at Champion mine, High-duty Nordberg. O. P. Hood. 780
Air-compressor-cylinder lubrication. 845
Air-compressor indicator cards. Max Kurth. 829
Air compressors, Allis-Chalmers intercooler for. *716
Air compressors, German designs of. M. Kurth. *103
Air compressors, Ingersoll-Rand vertical intercooler for. *823
Air compressors, Intercoolers for. H. V. Haight. *271
Air computer, Cox's compressed. *96
Air—Conditions of fan-blower design. 624, 810
Air-cushion experience. C. T. Porter. 610
Air explosive, A liquid. 327
Air, Fatal joke with compressed. 65
Air in England, Liquid; power production. 445
Air in Venturi tube, Flow of. 785
Air locomotives hauling cotton, Compressed. 837
Air, Not guilty as to liquid. 388

PAGE

Air—Pneumatic carriers in shops.. 856
Alcohol for small engines; Lucke's tests. 126
Alcohol in Europe, Experience with denatured. 388
Alcohol, Regulations as to denatured. 674
Alines engine, "Wise expert." G. W. 707
Alining—Hamilton's engine-erectors' adjuster. *662
Alining shafting. W. Osborne. 662
All-around man, The. 25, 158, 187, 313, 318, 319, 515, 578, 640, 679, 771, 816
Allen, Horatio. 182, 184, 185, 186
Allis-Chalmers-Bullock works, Canadian. 566
Alloys—Bearing metals. J. F. Buchanan. 138
Alloys in motor-car construction. 846
Alloys of antimony. 325
Alloys of lead, tin and bismuth; one melting at low heat. 681
Alloys, Tests of bearing. Melvin Price. *505, *535
Alphabet, Machine-made. 418
Aluminum bearing alloys, Tests of. *509, *535
Aluminum-casting notes. 295, 367
Aluminum in motor-car construction. 846
Aluminum silver. 567
Aluminum wire insulated by oxide, etc. 693
Alundum, the new abrasive. 617, 78
American Boiler Mfrs. See "Boiler."
American Chamber of Commerce, Paris. 105, 207
American Free Art League. 519
AMERICAN MACHINIST, Back numbers of. Pessimist. 643
AMERICAN MACHINIST. "Colloquial style" of. 101
AMERICAN MACHINIST—Last of the year. 852
AMERICAN MACHINIST, Non-delivery of. 755
AMERICAN MACHINISTS, Reading the. 156, 386, 456, 713, 747
AMERICAN MACHINIST—Subscription-agent imposter. 715
AMERICAN MACHINIST, Suggestions from. 157
AMERICAN MACHINIST, To readers of—Help wanted. 714
American Society, etc. See "Engineers."
"American Stationary Engineering." W. E. Crane. †648
American Wire Rope News. †824
"Analysis and Softening of Boiler Feed-Water." E. Wehrenfennig. †492
Anenometers—New formula. 125
Angle—Dyke's combination gage. *651
Angle, Most economical—Framed structures. *270, *611
"Angle of Action." etc. *190, *211, *244, 266, 357
Angle of irregular figure, Closing. G. E. Flanagan. *249
Angle plate, Making master. Jas. Dangerfield. *398
Angular pieces, Measuring. C. E. J. *189
Annealing an inner friction. *245
Annealing castings. W. H. Cook. *420
Annealing—Rockwell heating machine. *794
Annealing tool steel. K. T. Gifford. 680
Anthracite lands, Value of. 143
Antimony, Properties and uses of. 325
Apprentice boys, etc. Entropy. 93, 484
(Opportunities.) E. R. Plaisted. 240
Instructor. 705
Apprentice in the pattern shop. 691
Apprentice system. A. Greaser. 816
Apprentices in Russia. 603
Apprentices in small shop. Herman Jonson. 26
Apprenticeship, Boy's objections to serving. Pessimist. 25, 313
W. P. Hunt. 158
Optimist. 187
E. H. Fish. 318
(In the good old times.) L. L. Arnold. 319
(Specialist vs. all-round man.) Jack and Would-be Master of One Trade. 515
(Machinist's trade.) W. A. Bright. 578
Lucien I. Yeomans. 640
Con Wise. 649
Neralcm. 679
Cy. Cloid. 771
Junior Boss. 816
Apprenticeship committee of National Machine Tool Builders' Asso., Report of. (Wages; city and country boys; board at cost, etc.) Art Isan. 668
John E. Sweet. 818
851

PAGE

Apprenticeship, Evening school with credit on term of—At Sherbrooke, P. A. H. 573
Apprenticeship—General Electric's Lynn system, training shop, school, etc.; A. S. M. E. discussion. M. W. Alexander et al. 837, 852, 781
Apprenticeship. James Bell. 355
(Necessity for trade schools.) Entropy. 512
Arbor, Cheap saw; substitute for shoulder. C. A. Trask. *213
Arbor for machining connecting-rod brasses. *742
Arbor for making gear-cutter-forming tool. H. E. R. Manbrand. *154
Arbor of Wolcott rack cutter. *285
Arbors for piston rings, Clamp. H. E. R. Manbrand. *678
Arcs on naval gun sights, Finishing. *781
Arcs, Wheel for measuring. A. McAlpine. *29
Arches, Fire-brick. W. H. Bryan. 53
Arches, Reinforced-concrete. *403
Architecture, Engineering and. B. W. Kennedy. 699
Arithmetic—"Millionaire" calculating machine. *553
Armature-disk cutting press, Bliss. *716
Armor-piercing shell, Action of capped. E. K. v. Thurnwerth. *164
Armor plate and steel manufacture. 81
Armstrong, Death of Amos, B. 655
Art importations and manufactures, Free. 519
Art smith and his work, Dixie. *721
Artillery, Modern defensive—Sandy Hook. 791, 821
Artisan school, Prof. Sweet's. 226, 314, 318
Artist, Engineer and. B. W. Kennedy. 699
Asphalt foundation, Lathe on. 756
Assembling floor, Cleveland Automatic's. *19
Assembly jig, Drilling and. G. G. L. *316
Asserson, Death of Rear-Adm. 824
Automatic. See "Screw" (sub-entry "Screw machine), "Lathe" (sub-entry "Turret"), "Forming."

AUTOMOBILE.

—Bearing design, Defective ball. Johnse. *515
S. Bliss. *677
—Cabs and ominibuses in Paris. 511, 541
—"Catechism, Automobile." F. R. Jones. †256
—Connecting-rod brasses, Jigs and fixtures for machining automobile. "Triple Auto." *742
—Crank-shafts on Bogert lathe, etc., Machining American Daimler Co.'s "Mercedes." Hugh Dolnar. *146, *329
—Cylinder founding. Hugh Dolnar—Reedy practice. *138
Ferro practice; Garford cylinders. *300
Manufacturer's Foundry practice. *427
—Cylinder head, Packing. F. C. Mason. 441
—Cylinders, Jig for milling and drilling. Auto. *546
—Daimler Co. and others, Profits of 732
—Diagrams for power calculations; table of road resistances. Geo. Watson. *806
—Dining car, Motor. 549
—Drawings, Working; "Reo" practice. Hugh Dolnar. 253
—Engine, Molding and patternmaking of an automobile gas. E. F. Lake. *430
—Engines as used in automobile service, Comparison of 4-cycle gasolene—Number of cylinders, crank arrangements, power diagrams, etc. E. J. Bartlett. *834
—Engines, Piston pins of automobile. E. J. Bartlett. *454
—Exhaust, Perfuming automobile. 373
—Gear, Odd balance. *74
—Herkomer touring-contest-prize bequest. 225
—Horse, Displacement of; Royal Motor Car Co.'s improvised freight vehicle. 738
—Imports, exports and manufactures. 374
—India, Use in; practical purposes. 123
—Licensed Automobile Manufacturers, Asso. of. 550, 706
—Liquid air for power. 445
—Materials used in motor-car construction. E. J. Bartlett. 845
—Notes—Motor buses, heavy vehicles, tires, spring wheels, roads, motive power, crude oil. W. H. Booth. 685
—Patents, Selden. 550, 667

PAGE
—Rambler Auto. Wks., Concrete construction at. *199
—Screws and nuts for automobiles, Standard, Gerald. *706
—Shafts for sliding gears. W. Noble. *257
—Speed, Diagram for. E. H. Remde. *513
—Steel for automobiles, Vanadium. 469, 453
—Steering-gear part, Machining. Nomad. *59
—Truck, Automobile baggage. 326
—White motor car, Steam plant of. R. C. Carpenter. 780
Axis, Neutral. See "Beams."
Axles, Boring mine-car. A. Greaser. *616
Axles originating in drilled holes, Fractures of. L. A. Legros. *635

B

Babbitt boxes, Casting oil grooves in. 155
Babbitt metal, Friction of. *535
Babbitt metal. J. F. Buchanan. 137
Babbitt metals, Grades of. 375
Babbitt metals in motor cars. 846
Bach forula. Peter Palmer. 712
For related discussion see "Beams."
Backwoods, Machinist in the. W. L. McL. 354
Balance wheel, Molding heavy. J. A. M. *42
Balance wheels, Shrinkage stresses in. W. Osborne. 27, 359
Geo. F. Maddock. 160
Baldwin statue in Philadelphia. 654
Ball arbor, Grinding punches on. *438
Ball bearing. See "Bearing."
Ball test for hardness, Brinell. *73
Balls, Crushing of steel. *190
Balloons, Calcic hydride for inflating. 110
Baltimore shop, Some specialties of a. *465, *11
Bankers, Borrowing from, etc. 413, 581, 615, 748
Bar, Boring. See "Boring."
Bar on automatic, Drilling etc. 58
Barr & Stroud's dining room. 3
Barrel by hand, Rifling pistol. *351
(Rifling rifle barrel.) T. R. H. *679
Barrels caused warehouse collapse, Wedged. 348
Barrels, Iron-Clad Mfg. Co.'s steel. *119
Bauxite, Making alundum from. 617, 78
Beach, Death of Giles. 524
Beam construction, Reinforced-concrete-shop. *402
Beam trolley, An I-. *551, *773
Beam-trolley wheels, I-. C. D. King. *745
Beams, Cast-iron. Brachistochrone, C 41770, Cope Knowle, C 47196, John Edgar, Entropy, F. M. B., Peter Palmer, W. Osborne, Taylor, Sirrah, E. R. Plaisted, F. F. Nickel, F. E. Cardullo, John E. Sweet. *54, 91, 222, 249, 282, 384, 385, 522, *652, *676, 677, 711, 712, *813, 818, *849, 851
Beams, Making jawed levers, braces etc. from I-. C. W. J. *416
Beams, Weight of—Polar planimeter. *76
Bearing by filing, Curing hot. A. Miller. 642
J. J. Goodrich. 772
(Direction of tool marks.) M. B. Stauffer. 772
Bearing—Casting oil grooves in babbitt boxes. 155
Bearing design, Ball; table of dimensions. P. S. Bushnell. *51
Bearing design, Defective ball. Johnse. *515
S. Bliss. *677
Bearing, Loose-pulley. F. H. Sander. *283
Bearing—Machine-molding axle box. *240
Bearing metals. J. F. Buchanan. 138
Bearing metals, Microstructure and frictional characteristics in. Melvin Price. *505, *535
Bearing—Result of loose pin. W. Osborne. *696
Bearing, Turning plates for oil step. *746
Bearings—Double connecting-rod-box boring machine. C. T. Porter. 606
Bearings for roll grinding. 187
Bearings, Information wanted about journal. E. R. Plaisted. 485
(Rough finish: lubrication.) Jas. Bell. 645
(Loose fits.) E. H. Fish. *675
(Opportunity for schools.) Entropy. 679
(Mule pulley with spiral oil groove.) A. M. Gordon. *813
Bearings, Instances of wooden. 355, 419, 643
Bearings—Jigs and fixtures for machining automobile connecting-rod brasses. "Triple Auto." *742
Bearings—Lathe-spindle sizes. Instructor. 705
Bearings on machine tools, Ball; ball thrust bearing of Buffalo drill. R. C. Williams. *410
Bearings, Pressure on worm step. John E. Sweet. 851
Bearings, Prof. Sweet on wear of pulley. E. H. Fish. 675
Bearings, Roller; details. Trochee. *61
Bearings, Six-inch balls for. 589
Bed too big for planer, Planing. *27
Beds, Planing printing-press false. 465
Beeswax mixture for soldering. *744
Belgian electrical works, A. E. Guarini. *373
Belt compared with motor drive. 774, 777, 820
Belt sliding and worthless work. 582
Belts, Care of—Belt room; record card; cement splices; tension and thickness; endless belts; cleaning and oiling; inspection; operation, etc. C. J. Morrison. *309, 455
Belts—Planer-drives; speed, etc. *310, 598
Belting accidents. 34
(Putting belt on running pulley; looking after belts.) L. L. Arnold. *186
Belting, Removing delicate work with. *153
Belting tension—Factors of ignorance. 709
Bench and countershaft arrangement for bench lathe. Hardinge Bros'. *31
Bench, Shop. Univ. of Penn.'s. *530
Bending dies. Cyclo. *29
Bending pipe with spring for core. A. L. Hass. 24
Bending test, Record of impact. *381
Bertram & Sons Co., John. 565
Bevel—Dyke's combination gage. *651
Bevel, Knife-edge. C. W. Tucker. *58
Bicycle-chain links, Punching holes in. R. E. Weinland. *88
Bicycle gear, Pederson's. 105
Billings & Spencer Co.'s Canadian plant. 821
Blackening pipe mold, Plug for. *636
Blacksmith, An artist. Dixie. *721
Blacksmith shop, Dean, Smith & Grace's. *292
Blacksmith shop, Univ. of Penn. *531
Blacksmiths' convention, R. R. Master. 163, †823
Blister steel. E. T. Clarage. 573
Bloom chipping unnecessary; continuous heat. 478
Blow, Force of a. D. B. Dixon. 448
Blower. See also "Fan."
Blower driving—Small vertical engines. 769
Blower, Variable volume of air at fixed speed of. 610
Blower, Wm. Hollingsworth's rotary pressure; milling slots in rotor. *465
Blowers, Parsons turbine—Allis-Chalmers Co. 602
Blue-print constituted warranty, Whether. 572
Blue-print machine, Revolute. 622
Blue-prints for shop specifications. H. F. Noyes. *174
Blue-prints in shop, Recording. *814
Blue-prints, Suggestions on. E. F. Chandler. 123
F. H. Neely. 222
Entropy. 387
Board, Flat vs. vertical drawing. C. P. Fuller. 811
Board for apprentices at cost. 819
Board attachment, Reference. S. B. *249
Board for Patent-Office drawings. W. Heyes. 59
Boat at Niagara, Ice-breaking trolley. 173
Boat engine, "Wise expert" lines up. G. W. 707
Boat, English automobile torpedo. 327
Boat inspection, General Uhler on steam. 453
Boats, N. Y. municipal ferry. 355
Boats, Papin and invention of steam. 741
Boating. 272
Boiler and setting for bituminous coal. A. Bement. 779
"Boiler Design, Engine and," J. D. Hoffman. †715
Boiler, Locomotive with water-tube 842
Boiler Mfrs.' Asso. convention at Pittsburg, American—Gen. Geo. Uhler on steamboat inspection; B. E. D. Stafford on vanadium in steel manufacture; H. J. Hartley on recent Cramp boilers; superheated steam, etc. 453, 469
Boiler Mfrs.' Asso. meeting in 1907, American. 419
Boiler performance—White motor car. 780
Boiler-shell puzzle. C. W. Eugene Pierce. *216
Boiler-tube ends, Upsetting. A. Z. 382
Boiler-tube frauds, Alleged navy. *55
Boiler tubes, Experiment showing difference in temperatures of. C. T. Porter. 651
Boilers and smoke abatement. 52, 830
Boilers at Centennial, Judging. 433
Boilers for export, Poor. 184
Boilers, Making range. 33
Boilers, Return-tubular. C. T. Porter. *118
Bolivian markets. F. C. C. 327, 833
Bolsters, Press-die. C. Petitjean. 447
Bolt, Flexible. Patterson, Gottfried & Hunter, Ltd.'s. *282
Bolt and nut tables, Error in. F. W. Collins. *854
Bolt broken by small nut. 851
Bolt-cutter dies with end mill, Throating. 335
Bolt drawings, etc. 63, *216, *349, *220
Bolt heads, Milling jig for. A. G. F. 513
Bolt-threading machine. C. T. Porter. *84
Bolt-turning machine, Lassiter locomotive. 607
Bolts—Nut-checking devices. *214, *514, *128
Bolts, Tension in pole-piece. I. L. D. *773
Bolts. Tightening bottom-end. Senex Occidentalis. *680
Bond-paper drawings. General Elec.'s. *486
Bond paper vs. tracing cloth. W. H. Bradley. 798
Bonvillain molding machines, etc. *62, *236, *376, *727
Books, Russian wages. 851
Books, etc., Pocket. 524, 678, 711, 818, 849, 851
For rest of discussion see "Beams."
Bordeaux, International maritime exposition at. 633, 659
222

BORING. PAGE
—Bar cutters, Boring—Centering, gage, holding, grinding. W. L. Hardy. *246
(Accurate work.) H. E. R. Manbrand. *314
(Clamp to drive wedges; slotting bar, etc.) Draftsman. *351
Common Sense. *544
(General discussions; boring jig for making cutters, etc.) John Washburn. *358
(Chattering, wedging, centering gage, etc.) W. S. Leonard. *417
(Boring axles, etc.) A. Greaser. *616
(Comments, suggestions, slotter bar and broach, etc.) C. H. Caton, C. Petitjean and J. Schuring. *642
(Use of wedges, screws, etc.) U. B. S. *675
(Cutters with rake; a drill jig.) M. H. Ball. *770
H. E. R. Manbrand. *815
—Boring, drilling and milling machine, Arc milling on Detrick & Harvey. *731
—Boring machine, Defective horizontal turning and; lubricating. C. T. Porter. 607
—Boring head, 14-inch adjustable. C. W. Putnam. *581
—Boring mill, New Haven horizontal. *257
—Boring-mill rig for spiral work, Homemade. W. L. McL. *160
—Boring mills at I. P. Morris works, Two old. *393
—Boring paper and rubber, Turning and. Wm. Clark. 440
A. Greaser. 616
—Casting in place, Boring water-wheel. *82
—Connecting-rod-box boring machine, Double. C. T. Porter. 606
—Crank-pin-hole boring outfit with Bertram lathe. Canadian Rand Drill Co.'s. *766
—Cylinder-boring rig; lugs for clamping. *321
—Drilling, boring and tapping machine, Horizontal. B. F. Barnes Co.'s. *491
—Fixtures, Two—Drilling and boring jig; column-boring fixture. Racquet. *578
—Gun barrels, Feeds and cuts in. 122
—Head, Adjustable boring. H. E. R. Manbrand. *281
—Jig at works of Landis Tool Co. and its special tools, Large boring and drilling; boring bars, etc. H. F. Noyes. *141
—Jigs on vertical miller, Boring. *615
—Lathe, Boring large work on small. W. Alton. *156
—Lathe, High-speed surfacing and boring. Dean, Smith & Grace, Ltd.'s. *295
—Milling machine, Cadillac's boring and facing head for. F. A. H. *726
—Propeller, Machining. W. Burns. 305
—Pulleys, Rig for boring large. Repair Shop. *512
—Sheave, Reboring large. H. D. Pomeroy. 676
—Tire mill, Heavy Bertram (Niles-Bement-Pond.) *66
—Tool for boring rifle barrel. *679
—Tool holder for milling machine, Boring. H. E. R. Manbrand. *23
—Turning mill, Macchi & Passoni's vertical. 333
Boston subway ventilation. H. A. Carson, C. H. Churchill, L. H. Woodbridge et al. 784
Bottle guard, Rives'. 257
Box. See also "Bearing," "Tool."
Boxes for protecting pipes—Dimensions. *579
Boy's objections to apprenticeship. 25, 158, 187, 313, 318, 319, 515, 578, 640, 679, 771, 816
Braces from I-beams, Making jawed. *416
Bracket of Cleveland automatic, Feed. *18
Brady, Death of James. 168
Bragg, Death of Chas. A. 198
Brake on boring mill, Air. *160
Brass, Fire cracking of. 54
Brass stastistics, Some. 94, 127, 173
Brasses, Jigs and fixtures for machining automobile connecting-rod. "Triple Auto." *742
Brasses, Wooden. A. L. Haas. 419
Jas. Stanley. 643
"Brazing and Soldering." J. F. Hobart. †419
Brazing black-diamond tools. H. E. R. Manbrand. *86
Brazing gray iron. E. R. Markham. 23
Brazing shop and its work—N. Y. Brazing Co.; use of "Ferrofix;" brazing planer bed, etc. 460
Brazing without heat. T. R. Hassell. 217
Dixie. 355
Breaking forgings to test them. 817
Bridge, Raising Britannia; hydraulic material. 90
Bridges—Engineer and civilization. 700
Brinell ball test for hardness. *73
British and Americans—Altering tool sizes. 492
British attitude toward metric system. 33, 127, 549
British Standards Committee, Work of. 254, 388
British Weights & Measures Asso. 483, 671
Broach for slotting boring bar. *642

PAGE

Broaches for solid key of steel worm. J. J. Siebert. *807
Broaches while being ground, Jig for holding. C. W. Tucker. *155
Broaching brass rings. H. E. R. Manbrand. *247
Broaching fixture—Cutting keyways of die. *443
Broaching machine, Indexing job on Lapointe. *371
Bronze composition. Western Tube Co.'s. 387
Bronze, Manganese in manganese. 736
Bronze mixtures. 35
Bronze springs, Phosphor. H. R. Gilson. 79
Brown Hoisting Machinery Co. notes; roof construction. *22, 789
Building, Engineering, Univ. of Penn. *525, 553, *593, *843, 618, 628
Building, Hudson Companies' office. 753
Building—Reinforced-concrete shops. *400
Building—Saw-tooth roofs. 787
Building, Trinity—Plunger elevator test. 785
Building 700 feet high, Office. 432, 578
Buildings, Economy of material in framed. *270, *611
Buildings, Hights of—Elevator limits 769
Buildings, Notes on. 125, 299, 348, 367
Buildings, etc.—Engineers and civilization, 698
Bullard, Death of E. P. Opposite page 854
Bullet, New jacketed. 129
Burden, Death of James A. 460
Bureau of Standards, Meter comparator at. *547
Burroughs Adding Machine Co.'s shops. *697
Bushing for loose pulley. F. H. Sander. *283
Business advice—Starting shop. Entropy. 412, 581, 615, 748
Business and public life, Engineer in. 754
Business management, Course in. 610
Business matters, Education in. 730
Business scandals; effect abroad, 35, 98, 284, 418
Buttons, Making pearl; drilling holes. Dixie. 381
One of the Other Part. 543

C

Cable-drum jack. Pedrick & Smith's. *458
Cable to China, American. 253, 255
Calculating machine, An ingenious—The "Millionaire." H. J. Kennedy. *555
"California, Southern." Western Gas Engine Co. †99
Caliper. See also "Micrometer," "Gage."
Calipers, Stock-taking. A. P. Press. *122
Calorimetry, Gas-engine. F. E. Matteson. *112
Cam-cutting attachment for miller, Garvin. *681
Cam, Feed—Graduating range strips. *741
Cam formers on the milling machine, Making accurate. Dynamic. *613
"Cams, Design and Construction of." Smith, Halsey and others. †419
Cams for watch making, Precision; chart, formers, cam-cutting machine. Artebe. *488, *613
Cams of calculating machine. *559, *560, *562
Cams of Ideal die, Machining; profiling and grinding fixtures. *442
Cams of relieving attachment. *233
Cams on the castings, Laying out. R. E. Weinland. *71
Camera, Marking a sleeve for. *119
Camp of Nat'l Cash Register employees. *361
Canada Foundry Co. F. A. H. 565
Canada, Industrial development of; shops, etc. F. A. H. 564
Canadian plant, Billings & Spencer Co.'s. 821
Canal plant, Generators for Soulanges. 604
Canal, Steam shoveling at Panama. 105
Cans, Iron-Clad Mfg. Co.'s milk. *118
Canning—Corn cooker-filler. *466
Canoe bow iron, Welding. W. L. McL. 355
Cape Breton, Industries of. F. A. H. 567
Capped armor-piercing shell. *164
Car. See "Railroad."
Carbonizing of steel. E. T. Clarage. 573
Card, Belt-record. *309, 455
Card boxes and racks, Taylor system. *761
Cards—Indexing and numbering tools. *800
Cards, Le Blond shop-system. *312
Carlessness, Evils and restrictions of. Thos. D. West. 828
"Carmania," First American trip of. 437
Carnegie Co. and bessemer steel making. 728
Carnegie on wealth, Mr. 820
Carriers in machine shops, Pneumatic. 356
Cases, Tool. Univ. of Penn.'s. *529, *530
Cassier, Death of Louis. 65
Cassier's Magazine, Sale of. 753
Cast iron. See "Iron."
Casting. See also "Foundry."
Casting, Aluminum. 295, 367
Casting delivery and storage. Cin. M. T. Co.'s. *689
Casting direct from blast furnace. 518
Casting in place, Machining large waterwheel. Edw. Balbach. *82
Casting oil grooves in babbitt boxes. 155
Casting operation, Die. C. Petitjean. *95
Castings for motor-car construction. 845
Castings, Laying out cams on the. *71
Castings, Le Blond shop cards for. *313
Castings, Pickling and annealing. W. H. Cook. *420
Castings, Some very large. 367, 442, 534
Catalog, Providence public-library. 634
Catches and clasps, Duty on brass. 501
Catches for change levers. *202
Catgut, Tensile strength of. 127
Cement after crushing, Cube of. *191
Cement laboratory, Univ. of Penn. *601
Cement splices for belts. *309, 455
"Cement, Standard Methods of Testing and Specifications for." A. S. T. M. †193
Cement, To make steam-fitters'. 182
Census—Foundry and shop products. 548
Census—Manufacturing industries, 1900-1905. 673
Centennial, Experiences at. C. T. Porter. *182, 335
Center carriers for laying out cams. *71
Center of gravity found by balancing templet. F. E. Cardullo. *850
Center of gravity—Polar planimeter. *106
Centers, Garvin 8-spindle reamer. *228
Centering boring-bar cutters. *246, *417, *642
Centering roll necks. H. F. Noyes. 187
Centering wheel with precision level. *17
Chain drive—Renold rod-grinding machine. *229
Chain—Flexible bolt for clamping. *854
Chain links, Punching; shuttle die. *545, 709
Chain, Manufacture of detachable-sprocket. Locke Steel Belt Co.'s. F. A. S. *825
Chain side-bar punching scrap, Blowing away bicycle. *315
Chains, Punching holes in block links of bicycle. R. E. Weinland. *88
Chambering rifle barrel, Tool for. *679
Chambering tool for type-wheels. *12
Changes—G. E. drafting practice. *797
Changing one's occupation. Entropy. 647
"Charcas," New steamship. 811
Chase plates, Planing. 465
Chasers of Ideal die, Machining. *445
Chattanooga power and land values. 356
Chattering, etc—Boring-bar cutters. *417, *642
Check nuts, How to—Old and new ways. Wm. Boehler. *214
Mason. *514
A. F. C. *773
Checking drawings. 63, *217, *349, 386, 387, 513, 641, 645, 678, 770, 818
Checking system, Tool. Entropy. 317
Chemical laboratory, Morton Memorial. 196
Chest, Machinists' tool. Pedro. *710
Chile, Marine and locomotive jobs in. Alfred Prince. 415
Chilean earthquake. 823
Chip-cutting action. H. I. Hannover. *193
Chip fender, Finn's. 67
Chiseling action. H. I. Hannover. *340, 419
Chuck and face-plate case. *530
Chuck, Drill press. Cincinnatti M. T. Co.'s. *458
Chuck, Equalizing. H. E. R. Manbrand. *84
Chuck for broken-shank drills. *747
Chuck for facing clutch rings. Tangent. *746
Chuck for miller, Boring-tool. *23
Chuck, Jig for use with magnetic—Grinding broaches. *155
Chuck, Making Almond drill. E. A. S. *502
Chuck, Shellac. Robt. Grimshaw. *30
Chucks for brass type-wheels; making expanding screw-machine chuck; cutting T-slots; grinding jaw-holders; finishing jaws, etc. *12
Chucks for Ideal die parts. *443
Chucks for turning hand wheels. W. A. *318
Chucks, New design for spring. C. D. King. *745
Cincinnati Machine Tool Co.'s new shops. *689
Cincinnati, New enterprises in. 65
Cincinnati University and Cincinnati Metal Trades Association. 225
Civic Federation, National. 447, 753, 820
Civil-engineering dept., Univ. of Penn. *595
Civilization, Engineer and. B. W. Kennedy. 698
Claims upon machine-tool builders, Unjust. 756
Clamp hinged to drill jig. C. W. J. *158
Clamp, Light, strong toolmakers? R. A. Almond. *708
Clamp, Lighting. Bay State Tool Co.'s. 163
Clamp to drive boring-bar wedges. *351, *544
Clamps for milling vise. A. M. A. *29
Clamping cylinders for boring. *321
Clamping tail spindle. W. S. Leonard. E. H. Fish. *513
W. L. McL. 675, *676
Clamping work, Flexible bolt for. *854
Clark, Death of H. H. 824
Clay, Pressure experiments on. *192
Cleaning belts. C. J. Morrison. *310, 455
Cleveland Automatic Machine Co. notes. *20
Cleveland shop notes. *17
Clip, Blanking die and forming tool for a. W. H. F. *639
Clock—Bristol mechanical time recorder. *620
Clock, Decimal. *762
Clock mechanism of big telescope. *132, 162
Clock, Planetary gears for. Y. K. *747
Clutch, Air imprisoned in friction. 80
Clutch and speed variator, Harding hydraulic. 259
Clutch of slab milling machine. *8
Clutch rings, Manufacture of friction. Tangent. *746
Clutch used in calculating machine. *559
Coal, Annual demand for anthracite. 515
Coal, Boiler and setting for bituminous. A. Bement. 779
Coal, Combustion of small. 167
Coal, Italy's water power displacing. 109
Coal lands, Value of anthracite. 143
Coal-mine explosions and barometer. 682
Coal-mine wages and profits, Hindoo. 551
Coal-testing plant, Report on. †612, †715
Coal under water, Storage of. 398
Coals and smoke abatement, Different. 52, 433
Cock castings, Group of. *242
Cockerill works, John. E. Guarini. *110
Code words, Manufacturing. C. R. Harris. 815
Codron's experiments. H. I. Hannover. 212, *267, 357, *341, 419
Coes, Death of Loring. 130
Coins of crystal, Counterfeit. 692
"Cold weld" seam for range boilers. *118
Collapse, Resistance of tubes to. *44, *763
Collar, Ring to take thrust on. *213
Collet, Spring-chuck. C. D. King. *745
"Colossus of Roads," The. 648
Column-boring fixture. Racquet. *578
Columns, Large blast-furnace. 534
Columns of reinforced-concrete shop. *401
Comb, Oil. A. L. Haas. *514
Comments, Collection of. John E. Sweet. 851
Commerce. See "Trade."
Commission, Proposed metric—A. S. M. E. 789
Compagnie Internationale d'Electricité's works. *373
Comparing standard measure bars, Method of; meter comparator. L. A. Fischer. *547
Compass machine, The. C. H. Claudy. *1, 163
Compass points, Hardening. Kurt Stoye. 814
Compressed, Compressor. See "Air."
Compression, Deformation by. H. I. Hannover. *189, *211
Computer, Cox's compressed-air. *96
Computing machine, "Millionaire." H. J. Kennedy. *555
Concave faces, Turning. R. S. H. *746
Concentrators, Order for 1200. 203
Concrete applied to modern shop construction, Reinforced. E. N. Hunting. *400
Concrete-beam crane, Univ. of Penn. *601
Concrete, Bedding steel in. 125
Concrete buildings, Attaching shaft hangers to—Burroughs factory. 697
Concrete, Coefficient of expansion of. 551
Concrete construction at Rambler automobile works. John Erwood. *199
Concrete, Proportions of. 167
"Concrete, Reinforced." Buel and Hill. †823
Concrete wharves at Aukland, Steel. 646
Condenser, Jig for electrical. 350
Cone pulley. See "Pulley."
Congress and the Patent Office. 753, 715
Connecting rod. See "Rod."
Consular criticisms. 324
Contact, Worm. Robert A. Bruce. *623, *664
Contract and how it came out, Jones'. A. P. Press. 91
Contractors' employees, Russian law as to. 660
Convex and concave faces, Turning. R. S. H. *746
Cooker-filler, "Queen Anne" corn. *466
Copeland Mfg. Co.—Information wanted. 552
Copper and alloys, Friction of. *509, *585
Copper cylinder, Compression of. *193
Copper increasing, Demand for. 504
Copper output. 378, 583
Copper pipes, Effect of salt water on; protection. A. H. Nourse. *579
Copper ring, Forging. A. Smith. *159, 386
Copying in drafting, Avoiding. 811
Core. See also "Foundry," "Pattern."
Core board. *41
Core box, A. J. Wilson. *266
Core instead of core print, Using. W. Newton. *30
Core vents, Wax; bridge cores. *427
Core work, molder's ideas, etc. *263, *415
Cores for molding submarine pipe. *636
Cores, Setting cylinder. H. S. Brown. *321
Corliss and Corliss engine at the Centennial, Mr. 185, *183
Corn cooker-filler, "Queen Anne." *466
Corner, Acute-angled—Shop offices. *689
"Cornsheller" troubles. W. Osborne. *696
Corporations in England and America. 284, 418
Correspondence dep't. Univ. of Wis. 853
Correspondence, Instruction by. T. J. Foster. 583, 588
Correspondence-school symbolic method to business correspondence, Applying. 696
Correspondence school, The J. J. Clarke. 342
Correspondence Schools' anniversary, International. 550, 325
Corrosion of wrought iron and steel, Relative. H. M. Howe. 49
Cost-estimating slide rule. W. L. Miggett. *802
Cost keeping discussed by Messrs. Gunn, Geier et al. before Tool Builders. 522
Cost-keeping outfit, Taylor system. F. A. H. *761
Cost-keeping system, Le Blond. *312
Cost of keeping machines sold. 756
Cost of living in Russia. 632
Costs—Economy in shop management. D. C. Eggleston. 627

PAGE

Costs, Foundry. New Yorker. 752
Cottage, Things suggested by life in. Entropy. 251, 93, 241, 484
Cotton gin patent, Lane's. 578
Cotton mills, Conditions in Indian. 99
Cotton tree, of India, Spence—Sample gummed to trade journal. 802
Counterfeit coins of crystal. 692
Counter-shaft, Hardinge bench lathe. *31
Coupling, Putting on a. W. Osborne. 662
Crane, Concrete-beam. Univ. of Penn.'s. *601
Crane runway, reinforced-concrete shop. *403
Crane shop, Belgian electrical works. *375
Crank arrangements, Automobile-engine. *834
Crank-case, Machine-molding. *241
Crank-pin-hole boring outfit with Bertram lathe. Canadian Rand Drill Co.'s. *766
Crank-pin, Unhardened. C. T. Porter. 833
Crank-shaft, High-grade car-motor—American Daimler Co.'s "Mercedes"—Machining operations. Hugh Dolnar. *329
Crank-shaft lathe, Bogert. Hugh Dolnar. *146, 330
Crank-shaft on drilling, etc., machine, Turning. 102
Crank-shaft repair. Senex Occidentalis. *771
Crank-shaft repair; keying web with plugs, Senex Occidentalis. *486
Crank-shaft, Sawing head off. 100
Crank-shafts, Goose-neck tool for. *748
Cranks—Rotating shaft 180 deg. without dead center. E. J. Lees. 161
Creamery, Job around; separators. W. Osborne. 662
Credit, Cash or. Dixie. 581, 412, 615, 748
"Creole," The. 225
Cross-compound engine. C. T. Porter. *831
Cross sections—G. E. practice. *798
Crucible for brazing diamonds into shanks. *86
Crucible steel. E. T. Clarage. 573
Crucible withstood 81 heats. 377
Crushing experiments. H. I. Hannover. *189, *211
Crushing loads and micro-structure, Cast-iron. W. J. Keep. *273, 389
Crystal and grain hypothesis. *394
Cup packings, etc., Hydraulic. *322
Curves, Fenn's instrument for spiral. *67
Curved arcs, Measuring length of. A McAlpine. *29
Cut meter as tachometer. R. S. Brown. *83
Cut-off, Sickels trip. 185
Cutlery, American demand for British. 637
Cutter. See also "Tool," "Milling," "Gear," "Hobs."
Cutter and holder, Radius. O. G. Simmons. *319
Cutter, Bignall & Keeler rolling pipe. 622
Cutter, Expanding milling. Carroll Ashley. *221
Cutter-forming tool, Arbor for making gear. H. E. R. Manbrand. *154
Cutter-head mechanism of Pratt & Whitney thread miller; cutter-tooth design, etc. A. E. Tcherniak. *495
Cutter head of bolt-turning machine. *129
Cutter, Inserted-tooth—Blower-rotor slots. *467
Cutter, Tube. W. Maddison. *319
Cutter which broke in hardening, "High-speed" milling. E. R. Markham. *87
Cutters—Boring axles. A. Greaser. *616
Cutters, Boring-bar—Holding, grinding, centering gage, accurate work, boring axles, etc. W. L. Hardy. *246
H. E. R. Manbrand. *314
Draftsman. *351
Common Sense. *544
John Washburn. *358
W. S. Leonard. *417
C. H. Caton, C. Petitjean and J. Schuring. *642
U. B. S. *675
M. H. Ball. *770
H. E. R. Manbrand. *815
Cutters of cutting-off machine. *252
Cutters, Gang of chaser-blank. *445
Cutters, Relieving standard and spiral-ratchet thread milling. *234, *235
Cutters, Spiral-gear. *464, 549, 500
Cutting machine, Ship-model. *449
Cutting metals, Art of. F. W. Taylor. 774, 820
Cutting-off machine, Espen-Lucas cold saw. *37
Cutting-off machine, Westinghouse Co.'s. McK. *252
Cutting-off tool, Triple. H. E. R. Manbrand. *744
Cyanide, Tempering Novo steel with. Carroll Ashley. 216, 639
"Common Sense." 352, 614
J. F. B. 486
Riggs. 773
W. L. Hardy. 814
"Cyclops" floating naval workshop. 755
Cylinder, Duplex tool holder for turning. *221
Cylinder, Fitting cold piston in hot. 415
Cylinder founding, Motor-car. Hugh Dolnar. *138, *300, *427
Cylinder grinder, Mayer & Schmidt's. 333
Cylinder, Hard work replacing. W. Osborne. 799.
Cylinder head, Packing gasolene-engine. F. C. Mason. 441
Cylinder of Jacobson gas engine. *516
Cylinder—Piston projecting over ports. C. T. Porter. 832

PAGE

Cylinders, Casting gas-engine. E. K. Lake. *431
Cylinders, Compression of lead and copper. *192
Cylinders, Design and construction of. H. S. Brown. *320
Cylinders, Expanding reamer for. C. W. Putnam. *383
Cylinders, Jig for milling and drilling automobile. Auto. *546
Cylinders, Number and arrangement of auto. *834

D

Dams with polar planimeter, Calculating. *77
Dash pot for Porter-Allen governor. *607
Davidson, Death of Henry. 757
Dead center, Rotating shaft 180 deg. without. E. J. Lees. 161
Dealer and Customer, Manufacturer. Entropy. *817
Dean, Smith & Grace, Ltd., Works of. I. W. Chubb. *291
Decimal clock. *762
Decimal dimensions on drawings. *216, *349
Decimal equivalents, Table of. 432
Decimal point in slide-rule work. 92
Decimalization in England, Metric system and. 33, 483, 549, 671
Dedication of U. P. engineering laboratory. 553, 618, 628, 818
Deformation of materials, Experimental technology of. H. I. Hannover. *189, *211, *244, *266, 357, *340, 419, *363, *394
Delivery of papers, As to non. 755
Derricks, Boom. 348
Design, Ball-bearing. P. S. Bushnell. *51
Design—Conservatism and anticipation. Instructor. 705
"Design, Elementary Machine." C. L. Griffin. †619
"Design," "Elementary Machine." J. D. Hoffmann. †461
Design, Machine—Factors of ignorance. McAnic. 709
Design machine with wrong premise, Starting to. E. R. Plaisted. 677
Designing, Instructing apprentices in. 839, 852, 781
Designing—Quick drafting. C. P. Fuller. 810
Designing to meet the market. 324
Detail drawings—General Electric practice. *796
Diagram, Comparison with worm-gear. *181
Diagrams for automobile power calculations. Geo. Watson. *806
Diagram for speed of motor vehicles. *513
Diagrams, Gasolene-engine power. *834
Diagrams, Steam-turbine. Hans Holzwarth. 779
Dial mechanism, Calculating-machine. *562
Dials for navy guns, Graduating range. J. J. Strong. *425
Diameters in circular pitch, Multipliers for finding. S. L. H. 385
Diamond holder, Friction-disk-grinding machine. *659
Diamond tools, Brazing and lapping black; breaking a diamond. H. E. R. Manbrand. *86
Diamond turning points, Black. T. L. Dickinson's. *101
"Dictionary in Six Languages, Illustrated Technical." Dienhardt and Schlomann. †419
"Dictionary of Engineering Terms in English and Spanish, "Garcia's. †283
"Dictionary of Mechanical Drawing, Universal," G. H. Follows. †854
Die, Press. See "Press."
Die-casting operation. C. Petitjean. *95
Die, Manufacture of Ideal opening. F. A. S. *442
Dies with end mill, Throating. *220
Differential gear for automobiles. *74
Dimensioning drawings. *216, *349
Dimensioning drawings—G. E. practice. *797
Dimetric projections. Peter Palmer *207
Dining car, Motor. 549
Dining room, Barr & Stroud's. 3
Dining rooms, Iron-Clad Mfg. Co.'s. *115
Directory, Stevens Institute Alumni. †398
Dirty planer job, Shirking. W. Osborne. 800
Discharge of workmen in Russia. 634
Discipline, University and industrial. 628, 818
Disk inertia causes governor trouble. 336
Disks of Landis grinding machine, Machine for grinding concave. H. F. Noyes. *657
"Dividends, Labor Problem vs." †35
Divining rod, Use of. 549, 552
Dixon Crucible Co. Publications. †374, †634, †701, †794, †845, 752.
Dock-yards labor hours, English. 67
Dog, Planer. O. *30
Dominion Bridge Co. 566
"Dowsing." 549, 552
Draft, Discussion on balanced. 779
Drafting. See "Drawing."
Draw-bench casting, Molding a. *4
Draw-iron, J. F. Dawe's. *36

PAGE

DRAWING.

—Angle of irregular figure, Closing. *249
—Arc-measuring wheel for attachment to compasses. A. McAlpine. *29
—Automobile working drawings. Hugh Dolnar. 253
—Blue-print constituted a warranty, Whether. 572
—Blue-print machine, Revolute. 622
—Blue-prints for shop specifications. *174
—Board for Patent-Office drawings, Transparent drawing. Wm. Heyes. 59
—Bond paper vs. tracing cloth. 851
—Checking of drawings. G. F. Summers. 386
—"Das Skizzieren von Maschinenteilen in Perspektive." Carl Volk. †35
—Designing, Instructing apprentices in. 839, 852, 781
—"Dictionary of Mechanical Drawing, Universal." G. H. Follows. †854
—Drafting, Quick—Methods; natural scales; use of scales; flat vs. vertical board; avoiding copying, etc. C. P. Fuller. 810
—Draftsman instructed to design worthless machine. Nemo. 315
—Draftsmen: their qualifications, positions, salaries, holidays, etc., in England. W. Hargreaves. 87
Y. Z. 355
—Economy in patterns and drawings; what draftsmen should know. Pessimist. 353
—Economy. See also sub-entry "Systematic."
—Electrical signs and symbols. 22
—Envelope for drawings, Transparent. R. A. Lachmann. 61
—Erasing machine. H. S. Gladfelter. 281
—Filing system. C. T. Porter. 483
—Fraction graphically, Approximating value of. *499, *464, 549
—General Electric Co.'s drawing-office practice—General instructions; angles; titles; abbreviations; details; dimensions; calling for parts not delineated on detail drawings; finishes; part numbers; pattern numbers; changes; letters and figures; drawing lists; sketchbooks; cross sections for different materials; bond-paper drawings; mimeograph drawings; cross-section tracing cloth, etc. J.W. Upp. *795
—Ink-bottle guard, Rives.' 257
—Inkstand, Altneder's pen-filling. *822
—"Lettering with Original System for Spacing, Practical." †823
—"Mechanical Drawing, Elements of," A. A. Titsworth. †649
—Piston shown projecting. C. T. Porter. 832
—Projections, Dimetric. Peter Palmer. *207
—Reference board to drawing table, Attaching. S. B. *249
—Section liner, Graduated. A. J. W. *772
—Ship models from drawings, Cutting. *450
—Shop, Keeping track of drawings in machine. A. J. W. *814
—Spiral curves, Fenn's instrument for drawing. *67
—Straight-edge, Parellel-motion. *60
—System and lack of it; blue-prints destroyed because missent; girls to make tracings, etc. M. MacMichael. 733
—Systematic economy in making drawings; checking. Jay Paitch. 63
(Decimals; checking; a nut; choice of views; staggering dimension lines, etc.) Laurens. *217
(Decimals, diameters, dimension lines, checking, etc.) E. W. Beardsley. *349
(Forging drawing and machinist's drawing, checking, cheap labor, etc.) G. F. Summers. *349, 386, 513
(First-angle projection.) Entropy. 386
(Checking). W. Alton 641
(Checking). G. Schneider. 645
(Checking). E. R. Plaisted. 678
(Checking). Checkers. 770
(Checking; assembly drawings for patternmakers). Entropy. 818
—Technical graduate, A shortcoming of the—Scarcity of dimensions. Engineer. 86
Entropy. 219
—Title for drawings; lettering, numbers, scale, changes, etc. G. E. Flanagan. *605
—Tracer, Eliminating the; making drawings translucent; making and issue of blue-prints; erasing on brown-prints, E. F. Chandler. 123
F. H. Neely 222
Entropy. 386
—Tracing cloth with both sides dull; use of Fuller's earth. 249, 350, 357
—Triangle with protractor, Combination. *248
Artebe. *485
—Univ. of Penn.'s drawing rooms; standard table and stool; illumination; etc. *593, *844
Dredge, Death of James. 259
Dressing arcs on emery wheels. *84
Drifting ends of milled keyways. J. Price. *746

DRILL. PAGE

—Axle fractures from drilled holes. *635
—Bar on automatic, Rapid drilling and chamfering of. 58
—Bearing, Buffalo drill's ball thrust. *410
—Buttons, Drilling pearl. Dixie. 381
One of the Other Part. 543
—Chuck, Drill-press. Cincinnnati M. T. Co.'s *458
—Chuck, Making Almond drill. E. A. S. *502
—Cincinnati Machine Tool Co.'s shops. *689
—Connecting-rod-box boring machine. Smith & Coventry's. C. T. Porter. 606
—Crank-shaft on Fosdick drilling, boring and milling machine, Turning. 102
—Crank-shaft, Drilling wrist holes in. *330
—Drilling, boring and tapping machine, Horizontal. B. F. Barnes Co.'s. *491
—Electrical fishing for broken drill. 723
—Facing tool, Deep. M. H. Ball. *440
—Fixture. Drilling and grinding. Dixie. *122
—Grinders, Mayer's twist-drill. *223
—Grinder, Twist-drill. Mayer & Schmidt's 333
—Head, Drilling. Bayard. *26
—Holder, Improved drill. Jos. Stryhall. *217
—Jig at works of Landis Tool Co., Large boring and drilling. H. F. Noyes. *141
—Jig, Clamp hinged to drill. C. W. J. *158
—Jig, Combined filing and drilling. *305
—Jig, Drilling and Boring, Racquet. *578
—Jig for automobile cylinders. Auto. *546
—Jig for bell-shaped piece, Drilling. L. F. B. *383
—Jig for chuck-jaw holes. *502
—Jig for drilling clamping-screw lug, Adjustable. S. B. *155
—Jig for drilling steam-pump glands. "Steam Pump." *816
—Jig for electrical condenser. E. Klaps. *350
—Jig for hubs, flat arms and shafts, Drilling and assembly. G. G. L. *316
—Jig for machining feed bracket. *19
—Jig holes, Milling attachment for truing up. *726
—Jig, Universal drilling. H. F. Noyes. *390
—Jigs, Fixture for locating holes in. Artebe. *441
—Jigs for boring and drilling boring bars. *358, *770
—Jigs for drilling side of ring; drilling long hole in irregular shaped piece on centers, etc. F. J. Le Card. *50
—Jigs for making Ideal die. *443
—Jigs for medical-tablet tools. *438
—Jigs, Making drill—Drilling and boring on vertical miller. W. A. *615
—Milling machine, Transforming drill press into vertical. H. F. Noyes. *390
—Pattern and transfer plates, Drilling. *626
—Post drill. Buffalo Forge Co.'s. *326
—Propeller, Machining. W. Burns. 305
—Radial driller, Bickford plain. *459
—Radial driller. J. B. Morris Fdy. Co.'s *776
—Radial drilling and tapping machine, Newton. *326
—Socket for broken-shank drills. C. R. McGahey. *747
—Speeder, Drill. Graham Mfg. Co.'s. 622
—Spindle, Offset. J. W. McFarland. *92
—Stamping on drill press, Sheet-metal. *770
—Three-spindle drill. Foote, Burt & Co.'s *460
—Twist drill, Turning rod welded to. *711
—Vertical drills, Collett & Englehard's. 334
334
Drive, Chain—Renold rod-grinding machine. *229
Drive, Electric-motor, G. H. Schaeffer. 571
Con Wise. 750
Drive for chain reel. *827
Drive, Gear-box, H. T. Millar. *201
Drive, Thread-miller-cutter. *495
Drive, Tool. F. W. Taylor. 774, 820
Drives, Comparison of planer. W. H. Henley. *310
(Shifting-belt drive.) E. H. Waring. 598
Drives, Rope. R. Hoyt. *518
Drums, Spiral grooving of rope. *160
Dust-removing device, Grinder. 333
Duty. See "Tariff."
Dynamo. See "Electricity."
Dynamometer—Emerson power scale. *83
Dynamometer—Experimental ship tank. *452
Dynamometer, Improved transmission. W. F. Durand. 787
Dynamometer springs, Precision—P. R. R. traction dynamometer. A. H. Emery, Jr. *702

E

Earthquake, Shops destroyed by Chilean. 823
Echoes, Oil-country. See "Oil."
Economist, The engineer as an. C. J. H. Woodbury. 346, 365
Economy in patterns and drawings. Pessimist. 353
Economy in shop management. D. C. Eggleston. 627
Economy Systematic. See "Drawing."
Edison, Reminiscence of. C. T. Porter. 608

EDUCATION. PAGE

See also "Apprentice" and schools or colleges by name.
—Business management, Course in. 610
—Business matters, Education on; students' participation in institute management. 730
—Correspondence dep't, Univ. of Wis. 853
—Digging vs. skinning. Entropy. 711
For related discussion see "Beams."
—Graduate, A. shortcoming of the technical. Engineer. 86
Entropy 219
—Graduates, Demand for. Neraicm. 126 247
—Industrial Education, Organization of Society for Promotion of—Dr. Butler speaks; F. G. Vanderlip on foreign trade; F. P. Fish on citizenship; Alfred Moseley on American education; S. B. Donnelly on union labor; Miss Jane Addams; constitution, etc. 683, 518, 619, 681, 821
—Metric rule. Lufkin Rule Co.'s *631
—Morton Memorial laboratory. 196
—Pennsylvania State College shop course. †649
—School for instrument makers at University of Leyden. 99
—School of Commerce, N. Y. Univ.'s 491
—School, Prof. Sweet's artisan. 226, 314, 318
—School, Southern Pacific's technical. 606
—School symbols to business correspondence, Applying correspondence. 696
—School, The correspondence—Its relation to technical education and some of its results. J. J. Clarke. 342
—School with credit on term of apprenticeship, Evening—At Sherbrooke. F. A. H. 573
—Schools, Apprenticeship and necessity for trade. Entropy. 512
—Schools, Laboratory courses in engineering. C. E. Lucke. 296
—Schools and of the world, The education of the. 588
—Schools, International Correspondence—Origin and methods; instruction of miners and others. T. J. Foster. 583, 588
—Schools' anniversary, International Correspondence. 550, 325
—Technical education of the XXth century. J. C. Wait. 124
—Technical school and university. W. H. Burr. 532
—Technical students and apprentices. Entropy. 93, 484
E. R. Plaisted. 240
(Educators and engineers.) Instructor. 705
—University and industrial discipline and methods, Comparison of; elective system, etc. F. W. Taylor. 628
(Play spells, etc.) Entropy. 818
—Univ. of Penn. engineering building; methods; dedication; addresses by F. W. Taylor, A. C. Humphreys, J. M. Dodge, Adm. Melville et al. *525, 553, *593, 618, 628
—Workmen, M. W. Alexander on supplying skilled; General Electric's Lynn apprentice school and shop; methods; instructors; designing; holding graduates, etc.; discussion by A. S. M. E. 837, 852, 781
Efficiency of screws. J. W. Bramwell. 644
Eggs, to cure hens of eating. 342
Egyptian trade, Consular report on. †417
Eiffel tower, The. 521, 578
"Eisenhüttenwesen, Jahrbuch für das." †553
Elasticity—No rigid materials. 98
Elective system. F. W. Taylor. 629

ELECTRICITY.

—Aluminum wire, Insulation of. 693
—Armature-disk cutting press, Bliss. *716
—Belgian electrical works—Campagnie Internationale d'Electricité—Arc-lamp testing; dynamo assembling; sheet-metal department; winding shop; crane shop. E. Guarini. *373
—Clock, Power to run electrical. 713
—Condenser, Jig for. E. Klaps. *350
—Controller-cover fastening; simple spring tension for handle. *817
—Drill, Electrical fishing for broken. 723
—Dynamo and gas-engine tests—Laboratory method. C. E. Lucke. 297
—Dynamo spider, Molding. *63
—"Dynamos and Motors, Designs for Small," Herbert Pratt. †389
—Engineering ethics. S. S. Wheeler. 8
—Furnace, Making alundum in electric. 617, 78
—Generators for Soulanges canal plant. 604
—German direct-current railway. 74
—Grand-Rapids-Muskegon Power Co. 695
—Iron-Clad Mfg. Co.'s plant. *116
—Italy's dependence on water power. 109
—Laboratories of Univ. of Penn. *530, *593, *843
—Lamps, Better electric. 43
—Lighting, Growth of municipal electric. 325, 626
—Lighting Univ. of Penn.'s engineering building. *843
—Locomotives for P. R. R., Electric. 63
—Locomotives in Simplon tunnel, Electric. 130
—"Locomotives, Large Steam and Electric." J. E. Muhlfeld. †256
—"Management of Electrical Machinery." Crocker and Wheeler. †460
—Measuring machine for gages etc., Electrical. P. E. Shaw. *134
—Motor drive, Electric—Relative cost, breakdowns, etc. G. H. Schaeffer. 571
(An example; alternating currents.) Con Wise. 750
—Motor drive, F. W. Taylor on individual. 774, 777, 820
—Motor etc.—Planer-drive comparison. *310, 598
—Motors for Anaconda's Washoe smelter. Allis-Chalmers induction. *244
—Motors, New Stanley small induction. *66
—Multiple-voltage system of drive in cloth printing. 844
—Pole-piece bolts, Tension in. I. L. D. *680
-Pole pieces, Punches and dies for. *641
—Pole punchings, Press tools for. 352
—Power house shakes observatory. 54
—Railroad for single-phase electric traction, Equipment of Wash., Balt. & Ann. 638
—Railway, Rochester, Syracuse & Eastern. 673
—Screw threads for electrical apparatus, Standard. J. W. Upp. 63
—Sign, N. Y. Edison's big. 30
—Smelting of iron and steel, Electric. 658
—Tachometer, Vibrating. *507
—Transformer to low voltage, Vindex. 623
—Tunnel, Building Porfirio Diaz. 753
—Washington tunnel, Electricity in. 848
—Wiring a House. Herbert Pratt. †389
Elevator limits—Hights of buildings. 769
Elevator-plant test, Plunger—Trinity building. A. J. Herschmann, with A. S. M. E. discussion. 785
Emerson power scale. R. S. Brown. *83
Emery. See "Grinding."
Employer, An ideal. Entropy. 818
Employment—Choice of men and shops. 490
Employment in Russia. 602, 632, 659
Enamel, Fixing core sand with. *769
"Energy, Internal." J. V. V. Booream. †648

ENGINE.

See also "Piston," "Cylinder," "Rod," "Railroad," etc.
—Adjuster, Hamilton's engine erector's line. *662
—Air compressors, German. M. Kurth. *103
—Alcohol for small engines. 126
—Automobile-engine types. W. H. Booth. 685
—Bed casting, Allis-Chalmers engine. 442
—Bottom-end bolts; keying crank web. *486
—Crank-pin-hole boring outfit. *766
—Crank-shaft repair; indicator card taken with cord at angle from crosshead. Senex Occidentalis. *771
—Crank-shaft repair; keying web with plugs. Senex Occidentalis. *486
—Cylinder founding, Motor-car. *138, *300, *427
—Cylinder, Hard work replacing; erecting sawmill engine; disk placed on shaft too soon—W. Osborne. 799
—"Engine and Boiler Design." J. D. Hoffman. †715
—Fan engines; "steam trap." Dixie. 487
—Farm engine repair; wooden pins. W. D. Graves. 355
(Other unusual things.) Jas. Stanley. 643
—Fly-wheel accident, Otis Steel Co.'s. 714
—Fly-wheel safety-device fallacies. 391
—Gas- and gasoline-engine cylinders, Lunkenheimer lubricator for. 36
—Gas and gasolene engines, Features of Jacobson—Cylinder, valve gear, governor, etc. *516
—Gas and other engines, Design and construction of cylinders for. H. S. Brown. *320
—Gas cylinders in place of steam; running with either gas or steam, or both; odd types. W. Osborne. 2
—Gas-engine calorimetry; experiments on White gas engine. F. E. Matteson. *112
—Gas-engine-cam cutting attachment. *681
—"Gas Engine Design, Elements of." S. A. Moss. †648
—Gas-engine exhaust valves, Removing. W. Alton. *90
—Gas-engine governing. Jas. Atkinson. 95
—Gas-engine indicator, New French optical high-speed. *693
—Gas engine, Molding and patternmaking of an automobile; 2- and 4-cycle; cooling methods; Langley's light-built engine, etc. E. F. Lake. *430
—Gas-engine oil, Indentifying. W. Osborne. 79
—Gas-engine plant test, Fairbanks-Morse producer. 321
—Gas-engine safety attachment. W. Osborne. *69
—Gas-engine spiral-gear problem. 498, *464, 549
—Gas-engine tests—Laboratory method. C. E. Lucke. 297
—Gas engine using blast-furnace gas, Allis-Chalmers. Illinois Steel Co.'s. 848

PAGE

—Gas engines blowing bessemer converters. 755
—Gas engines in Sicily. 340
—Gas engines, Perry s. H. L. Arnold. 30
—Gas engines, Univ. of Penn's. *595
—Gas power, Evolution of. F. E. Junge, with A. S. M. E. discussion—Brayton engine; St. Louis fuel tests, European practice, blast-furnace gas, etc. 778
—Gas power plant, Producer. Gould Mfg. Co.'s. J. R. Bibbins. 779
—Gases, Raising steam from exhaust. 583
—Gasolene engine, Antoinette 16-cylinder. 97
—Gasolene-engine cylinder head, Packing. F. C. Mason. 441
—Gasolene engine for Russia, Largest. 534
—Gasolene-engine piston pins, Automobile. E. J. Bartlett. *454
—Gasolene engines as used in automobile service, Comparison of 4-cycle—Number of cylinders, crank arrangements, diagrams, etc. E. J. Bartlett. *834
—Gasolene launch-engine lined up by "wise expert." G. W. 707
—Indicator cards by templet; wooden brasses. 419
—Indicator, Continuous. Dreyer, Rosenkranz & Droop's. F. A. H. *672
—Internal-combustion engine, Bordreaux-Verdet. 705
—Internal-combustion engines, R. N. Flint's Patent-Office classification of. †398
—Iron-Clad Mfg. Co.'s engine room. *117
—Noises, Interpreting. W. Osborne. 567
—Oil comb. A. L. Haas. 514
—Pine island pump-plant test. 787
—Porter judging at Centennial, C. T.; Allis sawmill engines; large Corliss; Porter engine equal in output; fire engines; Canadian engine made up of best features of others; "table" engine exhibited by Brazil; Sickels trip cut-off; Horatio Allen and engines of the "Adriatic." C. T. Porter. *182
—Porter's regulating valve for Edgar Thompson mill's blowing engines; rolling-mill engine for Albany & Rensselaer I. & S. Co.; steam receivers; engine for Laclede rolling mill; broken gear; gear driving; governor trouble; inertia of disks on rocker shaft; engine for Gautier steel works; 900-revolution engine; Tabor indicator; water in cylinder; fly-wheel key driven into shaft; governor spindle sticks; fly-wheel construction; low boiler pressure; large engine for Cambria Co.; cylinder support; John Fritz' fly-wheel, etc. *335
—Porter-Allen engine, Cambria Co.'s; business arrangements with Southwark works; patent expert's treachery. 478
—Porter-Allen engine governor dash pot; engines for Phila. arc lights; warning against high-speed engines; 1000 engines for Edison; Calumet & Hecla; stuffing-box followers; Otis Steel Works' engine; indicator cards; Cambria Co.; air cushions, etc. *607
—Porter-Allen engine fly-wheel accident, Otis Steel Co.'s—Curious chain of circumstances. 714
—Porter's post-office engine; size of cylinder; steam pipe connected to exhaust; graft; Willimantic Linen Co.'s engines; cross-compound for Cheney Bros.; Atlanta exposition; Boston exposition; piston cone bases meeting in middle; the tail-stock adjustability; thumps; Russell & Erwin's engine; projection of piston over admission ports; error in changing drawing; B. F. Avery & Sons' engine; crank pin unhardened; quick replacement. *830
—Pumping engine at St. Louis Water Works, Record for duty established by Allis-Chalmers. 345
—Sleepy Eye engine? What became of the. Kiowa. *580
(Also 471, Vol. 27, pt. 1.)
—Steam chest, Offset spindle for drilling. *92
—Steam engine on earth, Smallest. T. H. R. *27
—Vertical engine, M. E. Howard. *67
—Vertical, high-speed engines, Small—Ideal requirements; lubrication; gravity-oiling; blower driving; oil filtering; enameling to fix core sand; oil pump, etc. F. R. Still. *768
—White motor car. R. C. Carpenter. 780

Engineer. See also "Education."
Engineer and civilization. B. W. Kennedy. 698
Engineer as a citizen. A. C. Humphreys. 553, 618
Engineer as an economist, The. C. J. H. Woodbury. 346, 365
Engineer, "Graft" experience with Government. C. T. Porter. 830
Engineer in business and public life. 754
"Engineers and How to Become One, Marine." E. G. Constantine. †715
Engineers, British Institution of Mechanical. 43

PAGE

Engineers—Demand for graduates. 126, 247
"Engineers, Examination Questions and Answers for Marine and Stationary." C. F. Swingle. †284
Engineers, Mechanical—The new secretary. 34
—Collapsing pressures of tubes. *44, *764
—Cast-iron crushing loads and microstructure. *273, 389
—Efficiency of screws. 644
—Laboratory method. C. E. Lucke. 296
—Tennessee river power; land values. 356
—Reinforced-concrete shops. E. N. Hunting. *400
—Smoke abatement. C. H. Benjamin. 433
—Standard-machine-screw committee report. *471
—Bearing metals. Melvin Price. *505, *535
—As to the new building. 576, 638
—New building; society affairs. 713, 715
—December meeting program. 681
—Fifty-fourth meeting. 774
—Plan to provide for a supply of skilled workmen. M. W. Alexander. 837, 852, 781
Engineers' Society of Western Penn. 524
"Engineering, American Stationary." W. E. Crane. †648
Engineering building in N. Y.—First use. 713
Engineering building, Univ. of Penn. *525, 553, *593, *843, 618, 628, 818
Engineering ethics; railroad instance. 432
Engineering ethics. S. S. Wheeler. 8
Engineering hand-books. 524, 678, 711, 818, 851
F. E. Cardullo. 849
For rest of discussion see "Beams."
"Engineering, Henley's Encyclopedia of Practical." †619
Engineering industries in Russia. C. P. Fuller. 602, 632, 659
Engineering profession. J. M. Dodge. 553
Engineering reminiscences. C. T. Porter. *182, *335, 478, *606, 714, *830
Engineering schools, Laboratory courses in. 296
Engineering societies, German. Henry Hess. 89
Engineering Standards committee, British. 254, 389
England, Draftsmen in. W. Hargreaves. 87, 355
England, Metric system in. 33, 127, 483, 549, 671
English as viewed by non-technical man, Technical, Dixie. 644
English practice regarding shop visitors. 751
Engraving compass cards, Machine for. *1, 163
Envelope for drawings, Transparent. R. A. Lachmann. 61
Erasing machine. H. S. Gladfelter. 281
Erecting engines—Hard jobs; an erector's error. W. Osborne. 799
Erecting machine—Message to Garcia. W. Osborne. 723
Erie, Electrifying the. 123
Estimates, Toolmakers' — Information wanted. 773
Estimating on patterns, Time. 691
Ethics, Engineering; railroad instance. 432
Ethics, Engineering. S. S. Wheeler. 8
Europe, Experience with denatured alcohol in. 388
"Examination Questions and Answers for Marine and Stationary Engineers." C. F. Swingle. †284
Exhibition. See also "Exposition."
Exhibition, Ireland's International. 654
Exhibition, Milan International. I. W. Chubb et al. 209, *268, 331, 842
Exhibition, Centennial. C. T. Porter. *182, 335
Expander, Lovekin tube. *258
Experiment. See also "Test."
Experimental technology of deformation of materials. H. I. Hannover. *189, *211, *244, *266, 357, *340, 419, *363, *394
Expert lines engine up, Wise. G. W. 707
Explosive, A liquid-air. 327
Explosions and barometer, Coal-mine. 682
Export. See also "Trade," "Business."
Export mistakes. 33
Exposition. See also "Exhibition."
Exposition at Bordeaux, International maritime. 222
Exposition at Seattle in 1909. 810
Exposition in Berlin, For a universal. 265
Exposition in Dublin, International. 99
Exposition, Jamestown. 549, 612, 766
Exposition of safety devices. 288, 612
Exposition, St. Louis — "Locomotive Tests." †128
Expositions, Atlanta and Boston. C. T. Porter. 831
Expositions, Government participation in international. 754
Extractor for shell-drawing die. C. Petitjean. *708
Extrusion, Process of. H. I. Hannover. *211

F

Face plate, Careless use of a. 756
Facing and recessing attachment for miller. H. E. R. Manbrand. 384
Facing edge of furnace hopper by hand. C. R. McGahey. *27
Facing gage for large boring jig. *143
Facing machine, Nut. C. T. Porter. 606, 610
Facing machine, Yost nut. *551

PAGE

Facing tool, Deep. M. H. Ball. *440
Facing water-wheel casting in place. *82
Factors of ignorance. McAnic. 709
Factors of safety—Tube tests. *47, *764
Factors of safety, etc. Entropy. 251
Factory, Old stage-coach. H. M. L. 577
Factory-roof construction—A. S. M. E. discussion. 787, 788, 789
Fallacy, Mechanical—Sleepy Eye engine. *580
Falling body, Force of. 448
Fan. See also "Blower."
Fan-blower design, Conditions of; Sturtevant practice. 634, 810
Fan engines; "steam trap." Dixie. 487
Fan of unusual proportions for C., B. & Q., Blast performance curves. Buffalo Forge Co.'s. *311
Fans, Large Allis-Chalmers ventilating. 616
Fans—Discharge of air. 409, *368
Farm engine repair. W. D. Graves. Jas. Stanley. 355 643
"Fatigue" in steel, Cause of. *397
Feed bracket of Cleveland automatic. *18
Feed cam—Graduating range strips. *741
Feed for chain stock in press. *826
Feed gear of Le Blond lathe. *738
Feed gear of slab miller. *8
Feed, Knock-off for automatic-gear-cutter. G. Ear. *248
Feed lines on ground work. 308
Feed mechanism, Yorkshire lathe. I. W. Chubb. *149
Feeds in boring gun barrels. 122
Feeds, Stops for press-punch. R. Earl Weinland. *314
Felt, Death of G. H. 794
Fender, Finn's chip. 67
Ferro foundry practice. Hugh Dolnar. *300
"Ferrofix," Brazing with. 460
Ferroinclave roof construction. A. E. Brown et al. 789, *22
Ferrule of drill chuck, Making. *503
Field-glass pamphlet, Warner & Swasey's. 243
Fiero, Mr.—Partnership arrangement. 588
Figures, Standard—General Elec. drafting office. *798
Filing jig. F. J. LeCard. *305
Filing machine, Bowers. *326
Filing machine, Simplex Mfg. Co.'s. *692
Filing shaft, Curing hot bearing by draw; direction of tool marks. 642, 772
Fillets, Tool for machining large. Burt Skellan. *158
Filtering oil. F. R. Still. *769
Fines in Russian shops. 659
Finishes—G. E. drafting practice. *797
Fire engine used in England, Old. 492
Fire engines at Centennial, Judging. 185
Fire, Unfireproofed structural-steel machine-shop before and after; reinforced-concrete durability. *399
Firth Stirling Steel Co. 685
Fisher, Death of Wm. 751
Fits—British Standards Committee. 254
Fits, Shrink. John E. Sweet. 851
Fixture. See also "Milling" and other classes of work referred to; also "Jig," etc.
Fixture for holding rectangular work in shaper, Cherry Red. *680
Fixtures, Power equipment as. E. P. Buffet. 833
Flange unions—Hydraulic packings. *322
Flaring tool, Lovekin tube. *258
Flasks, Cylindrical. *429
Flaws, Micro. *397
Floors made wrong, Shop. R. J. D. Entropy. *216 386
Floors, Notes on. 125, 299, 348, 367
Flow of air etc. S. A. Moss. *368, 407
Flow of fluid in Venturi tube. E. P. Coleman. 783
Flutes in worm-wheel hobs. H. I. C. and O. J. Beale. 487
Fly-wheel accident, Otis Steel Co.'s. 714
Fly-wheel contruction. C. T. Porter. *338
Fly-wheel, John Fritz'. *339
Fly-wheel key driven into shaft. 338
Fly-wheel, Molding heavy. J. A. M. *42
Fly-wheel safety-device fallacies. 391
Fly-wheels in lathe, Machining. C. A. Trask. *220
Fly-wheels, Minimizing shrinkage stresses in. 27, 160, 359
Food, Impure. 35, 98, 418
Fools who know they are fools, etc. 677
Force of a blow. D. B. Dixon. 448
Foreigners at Sandy Hook. 821, 791
Foreman's hardest task. W. Osborne. 800
Forge shop, Univ. of Penn. *531
Forging-action experiments. *340, 419
Forging copper ring. A. Smith. *159
(Making steel rings.) Entropy. 386
Forging rings edgewise. S. Uren. *490
Forgings for motor-car construction. 846
Forgings, Incident of welded—Manufacturer, dealer and customer. Entropy. *817
Formers, Making accurate cam. *448, *613
Forming machine, Rapid work on automatic. R. E. Weinland. 58
Forming tool for clip. W. H. F. *639
Formulas be standarized? Cannot symbols used in. W. Osborne. 709
Formulas for helical springs, Review of. *847
Formulas not scientific, Use of. 699
Foundation, Elastic lathe—Unjust claims. 756
Foundations of reinforced-concrete shop. *401

FOUNDRY PAGE

See also "Pattern."
—Aluminum castings. 295, 367
—Bronze mixtures. 35
—Carelessness, Evils and restrictions of. Thos. D. West. 828
—Castings, Pickling and annealing. *420
—Castings, Some large. 367, 442, 534
—Core instead of core print, Using. W. Newton. *30
—Costs, Foundry. New Yorker. 752
—Cylinder founding, Automobile. Hugh Dolnar—
Reedy foundry practice; drying molds, etc. *138
Ferro foundry practice; air furnace; Garford cylinders; neudels, etc. *300
Manufacturer's Foundry; wax core vents and machine; bridge cores; tin strainers; cylindrical flasks, molding pistons, etc. *427
—Cylinders, Design and construction of—Patterns, sulphur in scrap, setting cores, etc. H. S. Brown. *320
—Foundry Supply Association. 457
—Foundry, etc., products of U. S. 548, 673
—Molding a draw-bench casting in a flask and also by using the floor as a drag and bedding-in the pattern. R. H. Palmer. *4
—Molding and patternmaking of an automobile gas engine; air furnace; woods for pattern, etc. E. F. Lake. *430
—Molding columnn bases by piece work. 182
—Molding cone pulley on "Universal" machine; reply to article on Bonvillain system; classes of machines; use of hydraulic pressure; dynamo spider; note on G. P. Campbell's article, etc. E. Ronceray. *62
—Molding machine, Bonvillain rotative. *236
—Molding machines, Sand distributor and revolving sand frame for Bonvillain. *376
—Molding heavy balance wheel. J. A. M. *42
—Molding implement frame—The loose pattern and the machine-mounted pattern. G. Buchanan. *728
—Molding machine, Multiple. E. H. Mumford Co.'s (Rathbone, inventor.) *717
—Molding machine, Pattern mounting on Paxson-Hall; iron flasks; mounting methods; rapping device; core board; drawing pattern, etc. F. W. Hall. *39
—Molding machine, Paxson-Hall. $100, 129
—Molding machine, Tabor hinged. *261
—Molding, Mounting patterns for split-pattern machine; exact matching; drilling of pattern and transfer plates—Tabor Mfg. Co. practice. F. A. H. *626
—Molding submarine pipe; Ward's joint; blackening plug; gage for centering co- *636
—Molding tank—New method. H. J. McCaslin. *500
—Pattern may be improved by getting molder's ideas, How construction of —Molding frame of a machine; two-part job; three-part job; core work, etc. J. Wilson. *263
Core Wise. *415
—Pattern storage; Brown Hoisting's. *22
—Patterns, Iron-Clad Mfg. Co.'s tin. *118
—Pressures, W. H. Coleman on blast. 437
—Rapping-plate and draw-iron. Dawe's. *36
—Sand mixer, Stockham 257
—Sieve, Obermayer "Rockwell Riddle." 755
—Spindle for sweeping small work, Plate and. G. Buchanan. *25
—Stack lining broken—What to do. 677
—University of Penn. foundry. *526, *595
—Wheels, Minimizing shrinkage stresses in balance; is regular foundry practice wrong with fly-wheels? W. Osborne. 27, 359
Geo. R. Maddock. 160
Fraction graphically, Approximating value of. *499, *464, 549
Fractions, Addition of binary. G. Schneider. 82
Fractures of axles from drilled holes. *635
Framed structures, Economy of material in. F. R. Honey. *270, *611
Friction disks, Machine for grinding concave. *657
Friction engine, "Sleepy Eye." *580
(Also page 471, Vol. 27, pt. 1.)
Friction, Tension and inner; Rejtoe's researches. H. I. Hannover. *244, *363, *395
Friction, useful and otherwise, in machines and men. E. R. Plaisted. 240, 484
Friction, Worm-gear. *184, *144, 286, *667, *670
Frictions, etc., Turning paper. *440, 616
Frictional characteristics in bearing metals. Melvin Price. *505, *535
Fuel-testing plant, Report on. †612, †715
Fuels, Powdered; smoke abatement. 53, 434
Fuller's earth, Tracing cloth and. 350, 249, 357
Furnace—Boiler and setting for bituminous coal. A. Bement. 779
Furnace for Locke Steel Belt Co.'s chain, Continuous-hardening oil. *828
Furnace hopper, Facing blast. *27
Furnace lining broken—What to do. 677
Furnace, Making alundum in electric. 617, 78
Furnace—Rockwell heating machine. *794
Furnace, The Siemens-Martin. 574
Furnace types; smoke abatement. 53, 433
Furnace, Use of foundry air. *301
Furnaces of Roc Steel Castings Co. 98

G

Gage, bevel and angle, Dyke's combination. *651
Gage for centering pipe core. *637
Gage for large boring jig, Facing. *143
Gage for taper holes. Gerald. *709
Gage, Piston-rod-thread. E. P. Clark. *60
Gage work, Measuring angular pieces in. *189
Gages—A. S. M. E. committee report on standard machine screws. *471
Gages—Centering boring cutter. *246, *417, *642
Gages for machining brass type-wheels. *12
Gages in Russian shops. 633
Gages, Limit—British Standards Committee. 254
Gages, Misuse of. C. T. Porter. 182
Gages, etc., Electrical measuring machine for engineering; bar gages; contour curves; cylindrical gages. P. E. Shaw. *134
Gaging—Leveling planer by water. 773
Games at Iron-Clad works. *116
Garfield on business methods, J. R. 491
"Gas, Catechism on Producer." S. Wyer. †419
Gas engine. See also "Engine."
Gas for power by Illinois Steel Co., Use of blast-furnace. 848
Gas-governor seats in yoke of lamp, Facing and recessing. *384
Gas holder in Astoria, Large. 331
Gas power, Evolution of. F. E. Junge. 778
Gas-power plant, Producer. Gould Mfg. Co.'s. J. R. Bibbins. 779
Gas producer, Fichet and Henrtey's. *437
Gases, with special reference to small pressure differences, Flow of air and other. S. A. Moss. *368, 407
Gasolene engine. See "Engine," "Automobile."
Gasolene firing—White motor car. 780
Gate-operating mechanism, Water-turbine. *173

GEARING.

—Automobiles, Odd balance gear for. *74
—Bicycle gear, Pederson's. 105
—Cover, Pattern plates for gear. *240
—Cutter feed, Knock-off for automobile gear. G. Ear. *248
—Cutter-forming tool, Arbor for making gear. H. E. R. Manbrand. *154
—Cutter-head gearing, Thread-miller. *495
—Cutter, Macchi & Passoni's vertical gear. 333
—Cutters, Indexing mechanism for automatic gear. Artebe. *90
—Factors of ignorance. McAnic. 709
—Feed mechanism, Yorkshire lathe. *149
—Grinding-machine headstock; spiral gears, etc. H. F. Noyes. *150
—Headstock, Design of all-gear. H. T. Millar. *201
—Lathe-apron and feed mechanism, Champion. *590
—Lathe, Gearing of New Haven 36-in. *521
—Milling slot to depth for gear to mesh with rack. *56
—Multipliers for finding diameters in circular pitch. S. L. H. 385
—Pinion-cutting machine, Automatic, Eberhardt Bros'. *590
—Planetary gears. John Edgar. *188
Nemo. *251
C. E. Steere. 352
F. H. Neely. *422
Y. K. *747
—Rack cutter, Wolcott full-automatic. *285
—Rack-cutting attachment for miller. *577
—Racks and gears, Calculating machine. *557
—Rolling-mill engine breaks gear; making miter gears run noiselessly, gear driving, etc. C. T. Porter. 336
—Shrinkage, Allowance for—extra tooth. 692
—Sliding gears, Design of shafts for carrying. Warren Noble. *257
—Speed-change device. L. F. B. *121
—Spiral-gear problem simplified. John Edgar. 96
—Spiral gears, Complete graphical solution of. E. H. Fish. *694
—Spiral gears; formulas, cutters, problems, finding change gears, approximate fractions, etc. H. B. McCabe. *463, 549, *498
(With shafts at right angles.) J. Butterworth. 772
—Telescope, Machinery of big. *131, 162
—Worm and worm gear to diametral pitch, Cutting. *120
—Worm contact—Theory, friction test, etc. R. A. Bruce. *623, *664
—Worm-gear design. R. A. Bruce. *179, *670
A. M. Sosa. 286
—Worm gearing, Power transmitted by. A. Montague. 55
—Worm step bearings, Pressure on. John E. Sweet. 851
—Worm-wheel hobs, Flutes in. H. I. C. and O. J. Beale. 487
General Electric Co., Canadian. 565
General Electric Co.'s drawing-office practice. J. W. Upp. *795
General Elec.'s Lynn apprenticeship plan. 837, 852, 781
Generator. See "Electricity."
Geometrical problem. E. H. Lockwood, et al. *189, *414, 485, *643
Geometry—Closing angle of irregular figure. *249
German designs of air compressors. M. Kurth. *103
German technical societies. Henry Hess. 89
Germany, Increased manufacture of machinery in. 492
Germany, Laundry-machinery opening in. 848
Glands, Jig for drilling steam-pump. "Steam Pump." *816
Glass plate, Fracture lines of. *364
Gliding planes—Deformation of metals. *395
Gold, More—Prices and wages. 255, 51
Gold production of South Africa. 312
Goodman's researches, etc. *505, *535
Goose-neck finishing tool. H. E. R. Manbrand. *748
Governing, Jas. Atkinson on gas-engine. 95
Government employees, Computing wages of. 148
Government engineer, 'Graft" experience with. 830
Government influence on steel manufacture. 81
Government participation in international expositions. 754
Governor, Dash pot for Porter-Allen. *607
Governor—Fly-wheel safety device fallacies. 391
Governor of Jacobson "hit-and-miss" engine. *516
Governor of 10,000-h.p. water turbine. *172
Governor spindle stuck. C. T. Porter. *338
Governor trouble, disk inertia. 336
Graduate, A Shortcoming of the technical engineer. 86
Entropy. 219
Graduates, Demand for. 126
Neralcm. 247
Graduating range dials and strips for navy guns. J. J. Strong. *425, *740
Graft experience. C. T. Porter. 830
Graft in San Francisco. 683
Grain hypothesis—Metal deformations. *394
Grand Rapids-Muskegon Power Co. 695
Graphical solution of spiral gears. E. H. Fish. *694
"Graphite as a Lubricant." †701
Graphite for air-compressor cylinders. 845
Graphite, Smoke. 752
Grates, Chain. C. H. Benjamin. 434

GRINDING.

—Alundum, the new abrasive. Norton Co.'s. 617, 78
—Broaches while being ground, Jig for holding. C. W. Tucker. *155
—Cam-grinding attachment, Ideal die. *446
—Carwheel grinder, Norton. *411
—Combination wet and dry grinder. Bridgeport Safety Emery Wheel Co.'s. *620
—Cutters, Grinding boring-bar. W. L. Hardy. *246
—Cutters, Grinding pearl-button. 382
—Disk grinder, Besly double-head. *36
—Disk grinder, Double. Diamond Machine Co.'s. *420
—Disks of Landis grinding machine, Machine for grinding concave friction. H. F. Noyes. *657
—Drill grinder, Mayer's twist. *223
—Drill grinder, Twist. Mayer & Schmidt's. 333
—Emery products, Spain's tariff against. 805
—Emery wheels, Rig for grooving and rounding. Ike. *84
—Fixture, Drilling and grinding. Dixie. *122
—Fixture for bronze washers, Grinding. M. B. F. *60
—Fixtures for grinding tools and chuck jaw holders for machining type-wheels. *13, *16
—Grinder, Motor-driven. Bridgeport Safety Emery Wheel Co.'s. 854
—Grindstone strength, Dryness as affecting. 563
—Headstock for grinding machine, Design for. H. F. Noyes. *150
—Hob, Grinding; relieving attachment. *233
—Jig, Machining Landis grinding machine with large boring and drilling. *141
—Mandrel for clutch rings. Tangent. *746
—Milan, Grinding-machinery at—Mayer & Schmidt's, Naxos Union's etc.—Cylinder grinder, link grinder, saw sharpeners, wheel guards, dust-removing device, etc. 333, 334
—Piston-ring grinder. Graham Mfg. Co.'s. *650
—Pulley grinder, Wm. Hollingsworth's home-made. H. J. K. *11, *469
—Punches on ball arbor, Grinding. *438
—Rod-grinding machine, Special. Hans Renold, Ltd.'s. I. W. Chubb. *229
—Roll grinding. H. F. Noyes. 187
C. B. Norton. 489
—Springs, Grinding precision dynamometer. *703
—Surface grinder, Cheap. Grinder. *582

PAGE

—Surface plate, Ground. 672
—Tool-post grinder for bench lathe. Pratt & Whitney Co.'s. *621
—Universal grinder. Thompson Grinder Co.'s *289
—Wheels, Selection and use of grinding—Chatter marks; wheel contact; finishing; points to keep in mind; hardness of bond; feed lines; supporting a shaft while grinding, etc., H. Darbyshire. *306
Groove, Boring-mill rig for spiral. *160
Grooves in babbitt boxes, Casting oil. E. T. Strang. 155
Grooves in spindles, Fixture for cutting oil. L. F. B. *542
Grooves, Oil. James Bell. 645
A. M. Gordon. *812
Grooves on gun sights, Milling curved. *731
Grooving emery wheels. Ike. *84
Grooving—Indexing on broaching machine. *371
Guessing, Utility of. F. E. Cardullo. *850
John E. Sweet. 851
Gun barrels, Boring and reaming. 122
Gun—Capped armor-piercing shell. *164
Gun—Drilling bullet from rifle barrel. 354
Gun factory, John Cockerill. *111
Gun sights, Fixtures for finishing arcs on parts of naval. Detrick & Harvey Machine Co.'s *731
Guns and armor plate, Naval. 81
Guns—Excursion to Sandy Hook. 791, 821
Guns, Graduating range dials and strips for navy. J. J. Strong. *425, *740

H

Hack saw. See "Saw."
Hamilton, Ontario, Industries of. 564
Hammer blow, Force of. D. B. Dixon. 448
Hammer experiments. H. I. Hannover. *340, 419
Hammer, Learning to swing. A. Greaser. 616
Hand-books, Engineering. 524, 678, 711, 818, 851
Forrest E. Cardullo. 849
For rest of discussion see "Beams."
Handle, Simple spring tension for. M. MacMichael. *817
Handles, Rigging lathe to turn. E. R. Plaisted. 242
Hangers, Pipe. G. E. Flanagan. *57
Hangers to concrete buildings, Attaching shaft. *697
Hangers, Tool for measuring drop of. *122
Hannam, Death of E. Thomas. 290
Hard jobs, Some. W. Osborne. 799
Hardening and annealing tool steel. 680
Hardening carbon steels. 576
Hardening—Demand of tool-steel business. 520
Hardening fence wire for springs. 514
Hardening furnace, Continuous, for Locke Steel Belt Co.'s chain. *828
Hardening mixture. Riggs. 773
Hardening precision dynamometer springs. *703
Hardening—Rockwell heating machine. *794
Hardening scriber and compass points. Kurt Stoye. 814
Hardening with cyanide and otherwise. 216, 352, 486, 614, 639, 773, 814
Hardening, "High-speed" milling cutter which broke in. E. R. Markham. *87
Hardening high-speed steel. 68
Hardening iron, German process of. 213
"Hardening Steel, Helpful Hints on." J. W. Bennett. †649
Hardness, Brinell ball test for. *73
Harriman—"Colossus of Roads." 648
Hartmann's lines. *363
Harvesting machinery, Australian tariff on. 265
Hat packings. *322
Head, Adjustable boring. H. E. R. Manbrand. *281
Head, Drilling. Bayard. *26
Header for tube ends, Taper. *53
Heading Machine, Big Acme. 17
Headstock, Design of all-gear. H. T. Millar. *201
Headstock, Grinding machine. H. F. Noyes. *150
Heat of superheated steam, Specific. 780
Heat, Work wasted in—Worm contact. *667
Heating during winter concrete contruction. *403
Heating—Economy of low thermal efficiency. 8
Heating machine. Rockwell Engineering Co.'s *794
Hendey, Death of H. J. *821, 794
"Hendricks' Commercial Register." †325
"Henley's Encyclopedia of practical Engineering." †619
Hetherington, Death of Benjamin F. 423
"High-duty metal." Western Tube Co.'s 387
Hobs—Cutting worms to diametral pitch. *120
Hobs, Flutes in worm-wheel. H. I. C. and O. J. Beale. 487
Hobs on engine lathe, Relieving. *232
Hoists, etc.—I-beam trolleys. *551, *773, *745
Hoisting engines, Position for. 125
Hoisting mechanism, impact-testing machine. *379
Holder. See also "Tool," "Reamer," etc.

PAGE

Holder, Improved drill. Jos. Stryhall. *217
Holders, Die, C. Petitjean. *282
Hollingsworth, Shop of Wm. *465, *11
Holophane globes, Univ. of Penn. *845
Hopper, Facing blast-furnace. *27
Hours of labor. Entropy et al. 646, 378
Hours of labor in various trades. 501
House building as recreation. Entropy. 93, 251
E. R. Plaisted. 484
House-cleaning and its effects upon American business abroad, Our. 418, 35, 98
Hubs, etc., Drilling and assembling jig for. *316
Hunt & Co., R. W.—Partnership arrangement. 588
Hutton, Prof. F. R. *793
Hydraulic clutch and speed variator, Harding. 259
Hydraulic laboratory, Univ. of Penn. *593
Hydraulic machine molding. E. Ronceray. *62
Hydraulic machinery, Material for; use of oil as working fluid. A. L. Haas. 90
Hydraulic molding machine, Bonvillain rotative; pump, sand distributor, etc. *62, *236, *276
Hydraulic packings. A. Reeder. *322
Hydraulic press, Handy. Edward Balbach. *416
Hydraulic tests of tubes. *44 *763
Hydraulic wheel press, Large Niles. *420

I

I-beam. See "Beam."
Ignorance, Factors of. McAnic. 709
Illion, N. Y., Industries of. 489
Illuminating engineering, Noteworthy example of—Univ. of Penn.'s engineering building. *843
Illustrating, Realistic. 802
Impact experiments. H. I. Hannover. *340, 419, *396
Impact, Force of. D. B. Dixon. 448
Impact tests of wood. 829, 531
Impact-testing machine, Purdue. Hatt and Turner. *378
Implement frame, Molding. G. Buchanan. *728
Imports and exports, Classification of. 325
Imports, etc., Automobile. 374
Impostor sent to prison. 715
Independence of thought and action. Entropy. 484
Instructor. 795
Index, About our. 126
Index, Finding things in "Kent" without using. F. E. Cardullo. *849
Index plate for lathe, Relieving-attachment. *232
Indexing and numbering tools, Method of; vault for storing. L. A. Murray. *800
Indexing, Comprehensive. E. R. Plaisted. 678
Indexing job on broaching machine. *371
Indexing mechanism for automatic gear cutters. Artebe. *90
India, Labor Conditions in. 99, 551
India, Machinery in. 631
Indian cotton sample with trade journal. 802
Indian labor on Santa Fé. 417
Indicator card—Cord at angle. 771
Indicator card, Air-compressor. 829
Indicator cards by templet. A. L. Haas. 419
Indicator cards of Porter's cross-compound. *831
Indicator, Continuous steam-engine. Dreyer, Rosenkranz & Droop's. F. A. H. *672
Indicator diagrams—Polar planimeter. *78
Indicator for milling machine, Test. H. L. Cook. *316
Indicator, New French optical high-speed gas-engine. *693
Indicator Tabor. C. T. Porter. 337
Indicator, Test. A. E. Babin's *651
Industrial conditions, Italian. 210
Industrial development of Canada. F. A. H. 564
Industrial discipline and methods, Comparison of university and. F. W. Taylor. 628, 818
Industrial Education, Society for Promotion of 683, 518, 619, 681, 821
Industries in Russia, Engineering. C. P. Fuller. 602, 632, 659
Industries, 1900-1905, Manufacturing. 673, 548
Inertia, Moment of— Mnemonics; tabular method, guessing, etc. *652, *850
For rest of discussion see "Beams."
Inertia, Moments of—Polar planimeter. *107
Infringments, Patent. L. D. Kimball. 706
Injuries in Russian shops, Compensation for. 659
Ink-bottle guard, Rives.' 257
Ink retainer for pen. J. K. C. *248
Inkstand, Altneder's pen-filling. *822
Inquiry for machinery. 672
Inspection, General Uhler on steamboat. 453
Instrument makers at University of Leyden, School for. 99
Insurance, British attitude toward American. 284, 418
Insurance scheme for securing investors, Life. 748
Intercooler for air compressors, Ingersoll-Rand vertical. *823
Intercooler for air compressors, Allis-Chalmers. *716

PAGE

Intercoolers for air compressors. H. V. Haight. *271
Interlocking device on Yorkshire lathe. *150
"Internal Energy." J. V. Booraem. †648
International Correspondence Schools' anniversary. 550, 583, 325
International Harvester Co.'s Canadian works. 564
Inventive microbe, The. New Yorker. 749
Inventive problems. Leicester Allen. 22
Inventor's experience. A. P. Press. 91
Inventory-taking tools. *122
Investors, Mine traps for small. 648
Ireland's International Exhibition. 654
Iron and steel, Electric smelting of. 658
Iron and steel, Relative corrosion of wrought. H. M. Howe. 49
Iron beams, Cast. *54, 91, 222, 249, 282, 384, 385, 522, *652, *676, 677, 711, 712, *813, 818, *849, 851
Iron, Brazing gray. E. R. Markham. 23
Iron-clad Mfg. Co. H. J. K. *114
Iron columns, Use of cast. 125, 367
Iron crushing loads and microstructure, Cast. W. J. Keep. *273 389
Iron fence wire, Making springs of. 514
Iron, German process of hardening. 213
Iron—"Jahrbuch für das Eisenhüttenwesen. †553
Iron-manufacturing industries, Stastistics of. 673, 548
"Iron, Metallurgy of Cast." Thos. D. West. †649
Iron mountain in Durango, Mex. 563
Iron Mountain, Mo., Destruction of. 563, 684
Iron, Objected to chilled. C. B. Carter. 24
Iron ore, Large cargo of. 610
Iron-ore supply, Remainder of the. 520
Iron plate, Schedule weights of steel and. Centrode. 318
Iron surface, Magnified etched wrought. *596
Iron used in motor-car construction. 845
Iron work by art smith, Dixie. *721
Irons, Swedish and American; tool steel. 574
Irrigating plant at Pine island, Test of rotary-pump. 787
Irrigation progress in the West. 470
Italian industrial conditions. 210
Italian tariff, New. 457
Italy's dependence on water power. 109
Ivory, Working. Dixie. 382

J

Jack, Cable-drum. Pedrick & Smith's. *458
Jack, Press made from hydraulic. *416
Jacketed cylinders, Casting. H. S. Brown. 320
Jacketing, Gas-engine. E. F. Lake. *430
Jacobson gas and gasolene engines. *516
"Jahrbuch für das Eisenhüttenwesen." †553
Jamestown Exposition. 549, 612, 766
Japan, Government telephony in. 757
Japan, The attitude of. 455
Japanese tariff changes. 497
Jaw-threading cutters, High-speed-steel. 68
Jaws, Making Almond drill-chuck. *502
Jaws, Making type-wheel-chuck. *15
Jawed levers and braces from I-beams. *416
Jig. See also "Drill."
Jig at works of Landis Tool Co., Large boring and drilling. H. F. Noyes. *141
Jig, Combined filing and drilling. *305
Jig, Drilling and boring. Racquet. *578
Jig, Drilling. L. F. B. *383
Jig for bolt heads, Milling. A. G. F. *84
Jig for boring-bar cutters, Boring. *358
Jig for drilling boring-bars. M. H. Ball. *770
Jig for drilling chuck-jaw holes. *502
Jig for drilling steam-pump glands. "Steam Pump." *816
Jig for electrical condenser, Drilling and reaming. E. Klaps. *350
Jig for holding broaches while being ground. C. W. Tucker. *155
Jig for hubs, flat arms and shafts, Drilling and assembly. G. G. L. *316
Jig for machining feed bracket. *19
Jig for milling and drilling automobile cylinders. Auto. *546
Jig for punching holes in bicycle-chain links. *88
Jig holes, Attachment for truing up. *726
"Jig" made of plaster of paris. *727
Jig, Punching work by confining in. R. E. Weinland. *545, 709
Jig, Universal drilling. H. F. Noyes. *390
Jig work. F. J. Le Carô. *50
Jigs and fixtures for machining automobile connecting-rod brasses. "Triple Auto." *742
Jigs, Fixture for locating holes in. Artebe. *441
Jigs for making Ideal die. *443
Jigs for medical-tablet tools. *438
Jigs in Russian shops. 633
Jigs, Making drill—Drilling and boring on vertical miller. W. A. *615
Jobs, Some hard. W. Osborne. 799
Joint, Machining "ball-end-socket." Nomad. *59
Joints—Hydraulic packings. *322
Jones, Death of Arthur R. 553
Jones Speedometer Co.'s house warming. 715
Jones' contract and how it came out. 91

PAGE

Journal. See also "Bearing."
Journal, Indian cotton sample with trade. 802
Journal—*U. S. Trade Reports.* 227
Journals, Frivolity of certain. 101
Journals—Why mechanics do not read. 156, 386, 456, 713, 747
Judging at Centennial. C. T. Porter. *182, 335

K

Keith, Death of John M. 824
"Kent" without using index, Finding things in. F. E. Cardullo. *849
Kerosene, Tempering with. 352, 639
Kettle, Soda and potash. Manufacturing Equip. & Eng. Co.'s. *853
Key driven into shaft, Fly-wheel. 338
Key system—Sliding gears. W. Noble. *257
Keys, Solid; set of broaches. J. J. Siebert. *807
Keying crank web with plugs. *486
Keying etc. Boring cutters. *246, *417, *642
Keyseating mistake; faking. A Mere Turner. 750
Keyseating tool for shaper. Herman Jonson. *187
Keyways, Drifting ends of milled. J. Price. *746
Keyways in broaches, Grinding; micrometer points for measuring depth of Keyways. C. W. Tucker. *155
Keyways—Indexing job on broaching machine. *371
Keyways of Ideal die, Broaching. *443
Keyways, Protractor for shafts with two. *153
Kick's investigations. H. I. Hannover. *189, *211, *244, *340, 419
King Machine Tool Co. note. 80
Kitchen, Barr & Stroud's. 3
Kitchen, Iron-Clad Mfg. Co.'s. *117
Kleinhans, Frank B.—Address wanted. 674
Knife-edge tools. C. W. Tucker. *58
Knock-off for automatic gear-cutter feed. G. Ear. *248
Knowing what to do. E. W. Bowen. 677
Kobbe, Death of Philip. F. 423
Kodak, Marking a sleeve for. *119
Krupp employees, Number of. 256

L

Labor conditions in Italy. 210
Labor conditions in India. 99, 551
Labor conditions in Russia. 603, 632, 659
Labor costs, Hand and machine. 140
Labor, Doctor Patten on women's. 490
Labor—English dock-yards labor hours. 67
Labor hours and wages in various trades. 501
Labor, Hours of—Proper; nominal and actual; congenial occupations; recreation; reducing time, saving expense, etc. Entropy et al. 646, 378
Labor in Canada; alien law. 564
Labor in politics. 418
Labor—Boy's apprenticeship objections, specialization, etc. 25, 158, 187, 313, 318, 319, 515, 578, 640, 679, 771, 816
"Labor Problem vs. Dividends" T. S. Laughlin. †35
Labor, S. B. Donnelly on union. 684
Laboratory courses in engineering schools. C. E. Lucke. 296
Laboratory, Morton Memorial. 196
Laboratories, Engineering, Univ. of Penn. *525, 553, *593, *843, 618, 628, 818
Lamp, Facing and recessing part of gas. *384
Lamp, Nernst electric—Lighting Penn. station. 391
Lamp-testing department, Arc. *373
Lamps at Univ. of Penn.'s engineering building. *843
Lamps, Better electric. 43
Land on which to use cheap power. 356
Lands, Value of anthracite. 143
Landis works, Large boring and drilling jig at. *141
Lane's coach factory and inventions. 577
Lapping black-diamond tools. H. E. R. Manbrand. *86
Large work on small lathe, Boring. *156
Lath machine, Setting up. W. Osborne. 723

LATHE.

See also "Turning," "Facing," "Boring."
—Bed of Phoenix Co.'s lathe. 334
—Bench and countershaft arrangement for bench lathe; quick release. Hardinge Bros'. *31
—Bench-lathe jig work. F. J. Le Card. *50
—Bench lathe, Milling attachment for Cataract. Hardinge Bros'. *591
—Bench lathe, slide rest and milling attachment. B. C. Ames & Co.'s. *36
—Bench-lathe slide rest, Attachment for. F. J. Le Card. *387
—Bench lathe, Tool-post grinder for. Pratt & Whitney Co.'s. *621
—Boring fixture, Column. Racquet. *578
—British and Americans—Altering sizes. 492
—Chip fender, Finn's. 67
—Chuck and face-plate case. *530
—Chuck, Equalizing. H. E. R. Manbrand. *84
—Chuck, Operations on Almond drill. *502
—Chucks for turning hand wheels. *318
—Clamping tail spindle; wear of bearings. W. S. Leonard. 513
E. H. Fish. 675
W. L. McL. *676
—Crank-pin-hole boring outfit—Bertram lathe. *766
—Crank-shaft lathe, Bogert. Hugh Dolnar. *146, 330
—Crank-shafts, Lathe work on automobile. Hugh Dolnar. *330
—Cutters, Making boring-bar. *358
—Cutting metals, Art of. F. W. Taylor et al. 774, 820
—Dean. Smith & Grace, Ltd., Lathe works of; 24-inch lathe, boring and surfacing lathe, etc.; lathe testing. *291
—De Fries lathes at Milan. 333
—Designs ahead of times; size of spindles. Instructor. 705
—Engine lathe, 14-inch. Champion Tool Works Co.'s. *590
—Feed mechanism, Yorkshire M. T. Co.'s. lathe. I. W. Chubb. *149
—Fillets, Tool for large. *158
—Fits, Shrink. John E. Sweet. 851
—Fits, etc—British Standards Committee. 254
—Fixture for cutting oil grooves in spindles. L. F. B. *542
—Fixture, Spherical-turning. Gerald. *543
—Fly-wheels in lathe, Machining. C. A. Trask. *220
—Handles, Rigging lathe to turn. E. R. Plaisted. 242
—Headstock, Design of all-gear. H. T. Millar. *201
—Indicator, Test. A. E. Babin's. *651
—Lathe with geared head and motor drive, 14-in. portable. Prentice Bros.' Co.'s. *621
—Le Blond high-speed reducing lathe; cutting-speed diagram, etc. *737
—Millstones, Turning. W. L. McL. 708
—New Haven 36-inch lathe. *521
—Piston rings, Clamp arbors for. H. E. R. Manbrand. *678
—Propeller, Machining. W. Burns. 305
—Pulleys, Rig for boring large. *512
—Punches for medical tablets, Making. *438
—Radius cutter and holder. *319
—Relieving machine, Pratt & Whitney engine lathe as; attachment and various kinds of work. F. O. Hoagland. *231
—Rod welded on twist drill in large lathe, Turning small; turning tool; a threading tool. W. L. McL. *711
—Shaft in lathe, Straightening large. *156, 438
—Small lathe, Boring large work on. W. Alton. *156
—Speeds and feeds. 299
—Springs, Making precision dynamometer. *702
—Springs, Winding long. J. Bertram. *250
—Tail-stock adjustability. C. T. Porter. 831
—Taper attachment, Improvised. T. Tanyard. *30
—Tool, Adjustable nurling. W. Maddison. *546
—Tool, Goose-neck finishing. *748
—Tool holder. Carr Bros'. *326
—Tool holder, Duplex; roughing and finishing at same time. Carroll Ashley. *221
—Tool post, Improved. F. Rattek. *614
—Tools, Correct shape of lathe. F. Rattek. *283
H. Cameron. *417
—Turning and boring paper and rubber. Wm. Clark. *440
A. Greaser. 616
—"Turning and Boring Tapers." F. H. Colvin. †648
—Turning convex and concave faces without special attachments. R. S. H. *746
—Turning pearl, ivory, rubber, sponge, etc. 382, 514, 381
—Turret forming machine, Rapid work on—Drilling center of bar, cutting off, chamfering. R. E. Weinland. 58
—Turret, Garvin finishing box tool for. *163
—Turret lathe. See also "Screw machine" (sub-entry "Screw.")
—Turret lathe at Milan, Herbert. 334
—Turret lathe cutters and bars. *246
—Turret lathe, Floating reamer holder for. J. Green. *580
Conrad. *745
—Turret lathe, Machining automobile-steering-gear part in. *59
—Turret lathe, Pointing box-tool for. Anthony. *680
—Turret-lathe tool for shallow recesses. F. J. Le Card. *305
—Turret-lathe work, etc.—Automobile connecting-rod brasses. *742
—Unjust claims upon builders—Spindle thread ruined; elastic foundation; accident concealed; three and a fourth times instead of four; good level needed; wrecked and taken back; cost of keeping machines sold, etc. 756
—Worms to diametral pitch, Cutting. *120
Launch engine, "Wise expert" lines up. 707
Laundry-machinery opening in Germany. 848
Law notes. E. P. Buffet. —Gear wheel that emitted sparks and noise. 161
—Water-wheel governor at paper mill. 197
—Fly-wheel accident. 197
—Whether a certain blue-print constituted a warranty. 572
—When workman assumes risk of machine in case of unfulfilled promise to repair. 572
—Delaware law does not presume a defect in a machine to be chronic. 572
—What is machinery? 674
—What constitutes satisfaction. 674
—Relief from inspecting simple tools. 674
—Safe companies; right of competitors to use of name; personal rights of stockholders and officials. 727
—Contract for sale of Huntington mill; implied warranty; damages for breach. 811
—Power equipment as fixtures. 833
—Only reasonable foresight required. 834
—Limitation of duty to warn. 834
Law—Patents and monopolies. 356
Law situation, The patent. 667
Laws of social statics and dynamics. 618
Laws regarding smoke. 436
Laws, Russian factory. C. P. Fuller. 633, 659
Lawrie, Death of Chas. W. 757
Laying out cam castings. R. E. Weinland. *71
Lead and alloys, Friction of. *509, *535
Lead, Microscopic studies of deformed. *394
Lead, Pressure experiments on. *192, *211
Lead wool. 209
Leathers, Hydraulic. A. Reeder. *322
Lecturers, Warner and Swasey as amateur. 822
Legal. See "Law."
Lenses, Liquid. 73
Lettering drawings—G. E. practice. *798
Lettering with Original System for Spacing, Practical. T. F. Meinhardt. †823
Level, Edw. Rivett's home-made hydrostatic—Water pails. 635
(Water method for leveling planer.) Cincinnatus. 773
Levels by Warner & Swasey, Precision; centering wheel and truing sidewise; level-glass tester. *17
Lever, Brazing gray-iron. 23
Levers, Catches for change. *202
Levers, Fixtures for milling bronze. E. L. F. *122
Levers from I-beams, Making jawed. C. W. J. *416
Leyden, School for instrument makers at University of. 99
Library catalog, Providence public. 634
Library, Iron-Clad Mfg. Co.'s. *115
Licensees under patents vs. combined manufacturers. 550
Lighting Univ. of Penn.'s engineering building. *843
Lightning as oscillatory phenomenon. 323
Line adjuster, Hamilton's engine erector's. *662
Lines, Lüders' or Hartmann's. *363
Lines engine up, "Wise expert." G. W. 707
Lining shafting. W. Osborne. 662
Link-Belt Co. and Taylor system. *761
Link-Belt Company organization. 163, 228
Links, Machine for forming and assembling chain. *825
Liquid air. 327, 388, 445
List, Drawing—General Electric practice. *799
Living in Russia, Cost of. 632
Loads and microstructure, Cast-iron crushing. W. J. Keep. *273, 389
Loads, Notes on floor. 125, 299, 348, 367
Locking piston pins. *455
Locomotive. See "Railroad," "Electricity."
Lubricating loose pulleys. F. H. Sander. *283
Lubrication, Air-compressor-cylinder. 845
Lubrication, Bearings and. 485, 645, *675, 679, *812
Lubrication, Boring machine. C. T. Porter. 607
Lubrication—Curing hot bearing by filing; direction of tool marks. 642, 772
Lubrication of small vertical engines—Gravity system; filtering; enameling to fix core sand; oil pump, etc. F. R. Still. *768
Lubrication, etc., Worm-gear. 664
Lubricator for gas-engine cylinders, Lunkenheimer. 26
Lüders' lines. *363
Lug, Jig for drilling clamping-screw. *155
"Lusitania," The. 35, 65
Lynn apprenticeship system. 837, 852, 781

M

McElmell, Death of Edw. M. 757
Machine design, See also "Design," "Drawing."
"Machine Design, Elementary." C. L. Griffin. †619
"Machine Design, Elementary." J. D. Hoffmann. †461
Machine, Erecting—Message to Garcia. W. Osborne. 723
Machine-made alphabet. 418
Machine shop. See "Shop."
Machine-tool action, Deformation of Materials and. H. I. Hannover. *189, *211, *244, 266, 357, *340, 419, *363, *394

PAGE

Machine Tool Builders' Asso.
—Fifth annual convention; Mr. Gunn et al. on cost keeping, etc. 522
—Is it illegal? 550
—Report of apprenticeship committee. 668, 818, 851
Machine-tool building? Does simple equipment lessen cost of. 389
Machine-tool conservatism; ahead of times. Instructor. 705
Machine-tool operations, Slide rule for estimating cost of. *802
Machine-tool prices. 194
Machine-tool size alterations—National traditions. 492
Machine tools at I. P. Morris works, Interesting old. F. A. H. *393
Machine tools at Milan. 210, 331
Machine tools, Ball bearings on. R. C. Williams. *410
Machine tools, C. T. Porter's. 606, 481
Machine tools—Cutting metals. F. W. Taylor with A. S. M. E. discussion on Manchester tests, etc. 774, 820
Machine tools in back numbers. Pessimist. 643
Machine tools, Second-hand vs. new. 484
Machine tools—Testing that tests. 64
Machine tools to meet the market, Designing. 324
Machine tools, Univ. of Penn. *526, *594, *843
Machine tools, Unjust claims upon builders of. 756
Machines, Some peculiar. Neralcm. 123
Machinery hall, Milan, Working. *269, 332
Machinery, Humanity and. 54
Machinery in India. 631
Machinery, Increased cost of selling. 491
Machinery industries, Russian. 602, 632, 659
Machinery manufacture, Census statistics of. 673, 548
Machinery markets. See also "Trade."
Machinery, Selecting material for hydraulic. 90
Machinery? What is—Legal note. 674
Machining large water-wheel casting in place. Edw. Balbach. *82
Machinist in the backwoods. W. L. McL. 354
Machinist, Nervous—Being watched. W. Osborne. 800
Machinist sit while working? Should. By George. 850
Machinist's experience delivering and setting up machine, Young. W. Osborne. 723
Machinists do not read, Why; use of name "machinist," opportunities etc. 456, 156, 386, 713, 747
"Magnate," An electric. 390
Magnetic separator, Burlin's. *822
Magnetic wells. 138
Mail. See "Postage."
Malingering in Russian shops. 660
Man of unusual ability, Search for. W. Osborne. 723
Manchester tests, Discussion of. 774 et seq.
Mandrel for grinding friction-clutch rings. *746
Mandrel for winding long springs. *250
Mandrels, Removing delicate work from threaded. A. F. Miller. *153
Manganese in manganese bronze. 736
Manholes elliptical? Why are. 811
Manufacture and monopoly. 418, 618
Manufactures, Free art importations and. 519
Manufacturer, dealer and customer. Entropy. *817
Manufacturer's Foundry practice. Hugh Dolnar. *427
Manufacturing industries, 1900-1905. 673, 548
Maps by photography, Reducing. 186
Marine. See also "Ship" and cross references.
"Marine Engineers and How to Become One." E. G. Constantine. †715
Marine job in Chile. 415
Marine section at Milan exhibition. 332
Markets. See "Trade," "Business," "Tariff," etc.
Marking a sleeve, Press tools for. *119
Masonry, Engineering opportunity in. 700
Material. See also "Test," "Rigid," "Hydraulic," etc.
Material in architecture, Proper use of. 699
Material, Trouble in getting. W. Osborne. 696
Materials, Cross-sections for different. *798
Materials, Odd. Dixie. 381
H. D. Pomeroy. 514
One of the Other Part. 543
"Materials, Strength of." Slocum and Hancock. †649
Materials used in motor-car construction. 845
"Mathematics, Hand-Book of." J. Claudel. †389
Mather, Testimony of Sir Wm. 284
Mathewson, J. E. 392
"Mauretania," The. 35
Meals at Barr & Stroud's. 3
Measure. See also "Weight," "Metric."
Measure bars, Method of comparing standard. *547
Measuring angular pieces. C. E. J. *189
Measuring, Antiquated spelling and. 549
Measuring in stock taking, Tools for. *122
Measuring machine at Milan, Whitworth. 334
Measuring machine for engineering gages, etc., Electrical. P. E. Shaw. *134
Measuring tank at Presall, Water. *205
Meat scandal. 35, 98, 418
Mechanics do not read, Why. 156, 386, 456, 713, 747

PAGE

Mechanical Engineers. See "Engineers."
"Mechanical World Pocket Diary and Year Book." †715
Medical tablets, Press tools for. *438
Meerschaum, Working. Dixie. 382
Melting points of various metals. 448
Men and choice of shaps, Choice of. 490
Merchants' Association matters. 37
Merrick, William H. 480, 608, 830, 832
Message to Garcia, Carrying. W. Osborne. 723
Metal Trades Asso.—High-speed steel. 67
Metal-working processes, Deformation of materials and. H. I. Hannover. *189, *211, *244, *266, 357, *340, 419, *363, *394
Metals, Art of cutting. F. W. Taylor. 774, 820
Metals, Babbitt and other bearing. 137
Metals for motor-car construction. 845
Metals, Melting points of various. 448
Metals, Microstructure and frictional characteristics in bearing. Melvin Price. *505, *535
Metallographic studies. H. I. Hannover. *394
Metallography of cast iron. *273, 389
"Metallurgy of Cast Iron." Thos. D. West. †649
Meter as tachometer, Cut. *83
Meter comparator. L. A. Fischer. *547
Meter, Venturi; flow of gases. *369, 407
Meter, Venturi. A. S. M. E. discussion. 785
Meters, Broaching rings for water. *247
Meters, Use of water. 37, 226
Metric bill, Merchants' Asso. and. 37
Metric rule, Educational. Lufkin Rule Co.'s. *631
Metric system at Willans & Robinson's. 127
Metric system—British Weights & Measures Asso. 483
Metric system—Brit. W. & M. Asso.'s American corresponding secretary, H. H. Suplee; his position. 671, 790
Metric system in England. 33, 549
Metric system, Our present weights and measures and the—Proposed commission. H. R. Towne, before A. S. M. E., with discussion by Bancroft, Dale, Webber, Burlingame, O. Smith, J. M. Smith, Suplee, Halsey, Melville, Christie, Kent and Miller et al. 789
"Metric System, Outlines of Evolution of Weights and Measures and the." Wm. Hallock. †99
Michigan's experimental ship tank, Univ. of. *449
Microbe, The inventive. New Yorker. 749
Micrometer—Electrical measuring machine for gages. *134
Micrometer eye-piece of telescope. *132, 162
Micrometer frame. W. L. McL. *122
Micrometer points for keyways. *155
Microscopical examination of deformations of tough metals; Ewing and Rosenhain's work. H. I. Hanover. *394
Michostructure, Cast-iron crushing loads and—Report by Albert Saveur, photomicrographs etc. W. J. Keep. *273, 389
Microstructure, Cast-iron crushing loads Price. *505, *535
Milan Exhibition. I. W. Chubb et al. 209, *268, 331, 842
Milk-cans, Iron-Clad Mfg. Co.'s. *118
Mill, Legal note on Huntington. 811

MILLING.

—Arc milling on gun sights by Detrick & Harvey Machine Co. *731
—Attachments, Two milling—3-spindle and duplex. Carroll Ashley. *218
—Bearing, Curing hot milling-machine. 642, 772
—Bench miller. Hardinge Bros'. *591
—Boring and facing head for milling machine, Cadillac's. F. A. H. *726
—Boring bars, Slotting. *351, *544
—Boring-tool holder for milling machine. H. E. R. Manbrand. *23
—Cam formers on the milling machine, Making accurate. Dynamic. *613
—Cam-cutting miller attachment, Garvin. *681
—Chucks, Cutting T-slots in. *15
—Cincinnati M. M. Co.'s "Examples of Rapid Milling." †819
—Clamps for milling vise. A. M. A. *29
—Clutch rings, etc., Handy device for milling slot in. *746
—Crank-shaft, Machining "Mercedes." *330
—Cutter, Adjustable. Carroll Ashley. *221
—Cutter, Inserted tooth—Blower-rotor slots. *467
—Cutter which broke in hardening, "High-speed." E. R. Markham. *87
—Cutters, High-speed steel. E. Childs. 68
—Drill press into vertical milling machine, Transforming. H. F. Noyes. *390
—End mill, Throating dies with. A. B. Ginner. *220
—Experiment in milling one and two rows of castings together. Ford. *56
—Facing and recessing attachment for miller. H. E. R. Manbrand. *384
—Fixture, Internal milling; fixture for milling slot to depth for gear to mesh with rack. L. F. B. *56
—Fixtures for milling bronze levers. E. L. F. *122

PAGE

—Fixture for milling Ideal opening-die parts; gang of cutters for chaser blanks; profiling cams, etc. *443
—Fixture for milling hexagon nuts and milling screw heads. Cyclo. *439
—Gear problem simplified, Spiral 96
—Hand milling machine, Pratt & Whitney. *552
—Indicator, Test. H. L. Cook. *316
—Jig for automobile cylinders. Auto. *546
—Jig for bolt heads, Milling. A. G. F. *84
—"Jig," Plaster of paris. *727
—Jigs and fixtures for machining automobile connecting-rod brasses. *742
—Jigs, Vertical miller fitted for drilling and boring. W. A. *615
—Keyways, Drifting ends of milled. *746
—Lathe, Hardinge milling attachment for bench. *591
—Lathe, Milling attachment for Ames bench. *36
—Lathe slide-rest attachment, Bench. *387
—Milling machine, Heavy vertical. Niles-Bement-Pond Co.'s (Bertram Works.) *101
—Milling machines, Two Brown & Sharpe plain. *288
—Nut-facing machine. C. T. Porter. 606, 610
—Rack-cutting attachment for miller. Racquet. *577
—Slab milling machine, J. Holroyd & Co.'s. Jas. Vose. *7
—Springs made in P. & W. thread miller, Precision dynamometer. *702
—Thread miller, Cutter-head mechanism of Pratt & Whitney. A. E. Tcherniak. *495
—Milling machines, Horizontal and vertical. Dean, Smith & Grace, Ltd.'s. *294
—Rings, Milling gap in packing. 353
—Thread-milling machine, Pratt & Whitney taper attachment for. *652
—Worm gear, Cutting; diametral pitch. *120
Millstones, Turning. W. L. McL. 708
Mimeograph drawings. 798
Mine conditions in India, Coal. 551
Mine explosions and barometer, Coal. 682
Mine traps for small investors. 648
Miners, Correspondence instruction of. 583, 586, 588
Mirror, Watch case as a. Pedro. 710
Mixer, Stockham sand. 257
Model-cutting machine; experimental ship tank. *449
Model machine—Indexing and numbering tools. *801
Molding. See "Foundry."
Molecules of body in compression. *190
Moments of Inertia—Mnemonics, tabular method, guessing, etc. *652, *850
For rest of discussion see "Beams."
Moments of inertia—Polar planimeter. *107
Money for starting shop, Getting. 413, 581, 615, 748
Monkey wrench, Bemis & Call steel-handled. *459
Monkey wrench, Large new Coes. 848
Monopoly, Iron ore and. 520
Monopoly, J. D. Rockefeller and. 649
Monopoly, Manufacture and. 418, 618
Monopolies and anthracite lands. 143
Monopolies, Patents and. 356
Monorail system. 162
Montreal, Industries of. F. A. H. 566
Moore at Centennial, James. 182
Moores, George; Brit. Wts., etc. 483, 671
Morin's laws etc. *505, *535
Morrin, Death of Thos. F. 198
Morris works, Old tools at I. P. *393
Morton Memorial laboratory. 196
Motion, Perpetual—Sleepy Eye engine. 580
(Also page 471, Vol. 27, pt. 1.)
Motion, The 6-9 perpetual. Jarge. 83
Motor. See "Electricity," "Engine," "Automobile,".
Mountain railways. B. W. Kennedy. 701
Mule-pulley design. A. M. Gordon. *812
Multiplication, etc., Calculating machine for. *555
Multiplication with slide rule. 92
Multipliers for finding diameters in circular pitch. S. L. H. 385
Municipal electric lighting, Growth of. 325, 626
Municipal-ownership symposium—Moody's Mag. †628
Museum, Exposition of safety devices at. 288, 612
Mushet steel. F. A. Osborne. 776

N

Nacke, Death of Frank D. 655
Name and address, Send your full. 489
Name, Use of trade. 727
Nason, Death of Carleton W. 655
National. See also "Machine Tool," "Civic."
National Cash Register employees, Camp of. *361
National Supply and Machy. Dealers' Asso. 491
Naval gun sights, Finishing arcs on. *731
Naval Observatory, Big telescope at. *131, 162
Naval repair ship, English. 755
Naval requirements on steel manufacture, Influence of. Pilgrim. 81
Navy—Alleged boiler-tube frauds. 651

PAGE

Navy—Capped armor-piercing shell. *164
Navy—English dock-yards-labor hours. 67
Navy—Floating steel target. 626
Navy guns, Graduating range dials and strips for. J. J. Strong. *425, *740
Navy yard, Premium plan in Washington. 129
Navies, Ships in French and German. 193
Negligence, Evils and restrictions of. Thos. D. West. 828
Neudels on molds, Use of. *303
Neutral axis, Location of. John Edgar. 249
For connection see "Beams, Cast-iron."
New London Marine Iron Works. 410
New year, The. 852
New York, N. H. & H. Cos Cob station. 179
New York University's School of Commerce. 491
Niagara falls, Future of. F. A. H. 564
Niles-Bement-Pond Co. affairs. 713
Nitrogen in iron, Effect of. 574
Noises, Experiences interpreting. W. Osborne. 567
Norton Co. and alundum wheels. 78
Notching fixture for punch press. C. Petitjean. *154
Notes, Discounting. Entropy. 413, 581, 615, 748
Numbers, Drawing, part and pattern—G. E. practice. *795
Numbering tools, Method of indexing and. L. A. Murray. *800
Nurling tool, Adjustable. W. Maddison. *546
Nurling tool for rings of die. *443
Nut, Bolt broken by small. 335
Nut drawings. *217, *349, 387
Nut-facing machine. C. T. Porter. 606, 610
Nut-facing machine, Yost. *551
Nut tables, Error in bolt and. 851
Nuts, Cutting-off tool for check. *744
Nuts, Drill-chuck—Threading; fracture, etc. *503
Nuts, Fixture for milling hexagon. Cyclo. *439
Nuts for automobiles, Standard. Gerald. *706
Nuts, How to check—Old and new ways. Wm. Boehler. *214
Mason. *514
A. F. C. *773
Nuts, etc., Milling jig for. *84
Nuts, Tightening bottom-end-bolt. *486

O

Observatory, Big telescope at Naval. *131, 162
Odd materials. 381, 514, 543
Oil. See also "Lubrication."
Oil comb. A. L. Haas. *514
Oil country, Echoes from the. W. Osborne.—Gas and steam engines combined, alternative, etc. 2
—Minimizing shrinkage stresses in wheels. 27, 160, 359
—Cast-iron beams. 522, *54, 91, 222, 249, 282, 384, 385, *653, *676, 677, 711, 712, *813, 818, *849, 851
—Use and abuse of tools. 29
—An engine safety attachment. *69
—Identifying oil with "homemade" apparatus. 79
—Cutting long square-thread screw without lathe or die and utilizing scrap pile. 280, 354
—Experiences in interpreting noises. 567
—Loafing job around creamery; coupling; lining shafting; separators. 662
—Customer's complaint; "cornsheller" troubles; abusing machine; result of pin working loose in bearing; badly worn loose pulley; trouble in getting material; applying correspondence-school symbols to business corespondence. *696
—Cannot symbols be standardized? 709
—Message to Garcia; young machinist delivering and setting up machine; search for man of unusual ability. 723
—Hardest job for machinist—Replacing cylinder; erector's error; disk placed on shaft of sawmill engine too soon; shirking dirty planer job; nervous machinist; being watched; foreman's hardest task. 799
Oil firing at Iron-Clad works. *116
Oil for autos, Crude. W. H. Booth. 686
Oil furnace for continuously hardening chain. *828
Oil grooves in babbitt boxes, Casting. E. T. Strang. 155
Oil grooves in spindles, Fixture for cutting. L. F. B. *542
Oil grooves, Jas. Bell. 645
A. M. Gordon. *812
Oilholes, Loose-pulley. F. H. Sander. *283
Oil with "homemade" apparatus, Identifying. W. Osborne. 79
Oiling belts. C. J. Morrison. *310, 455
Oiling small vertical engines—Gravity system, filtering, pump, etc. F. R. Still. *768
Operation tool card. L. A. Murray. *801
Opportunities. E. R. Plaisted. 240, 484, 705
Opportunities, Rockefeller's views on limiting. 649
Order system. Le Blond shop. W. T. Harris. *312
Ore supply, Remainder of iron. 520
Orifice, Clay and lead pressed through. *211
Orifices, Device for holding and changing. *599
Orifices, Flow through. S. A. Moss. *368, 407
Overheated and superheated. 195
Owen, Death of William H. 360
Ownership, Public. 325, 387, 447, 626, †628

P

Pack saddle on wheels. 162
Packing gasolene-engine cylinder head. F. C. Mason. 441
Packing goods for foreign shipment. 631, 637
Packing-house scandal. 35, 98, 418
Packings, Hydraulic. A. Reeder. *322
Paint in San Francisco, Graphite. 374
Painting galvanized iron—Applying vinegar. 359
Palladium, Note on. 363
Paper. See also "Journal."
Paper and rubber, Turning and boring. Wm. Clark. *440
A. Greaser. 616
Paper drawings, Bond. General Elec.'s. 798
Paper-making machine, Large. 179
Paper-perforating machine. *568, 647
Paper vs. tracing cloth, Bond. W. H. Bradley. 851
Papers, As to non-delivery of. 755
Papin and invention of steamboats. 741
Parallel-motion straight-edge. F. W. Harris. *60
Paris, Bulletins of American Chamber of Commerce. †105, †207
Partner, Justice to heirs of diseased. 588
Patent bought to put it on the shelf. 91
Patent-case judges, Expert advisers of. 667
Patent expert's treachery. C. T. Porter. 481
Patent experts. S. S. Wheeler. 10
Patent law, Turkish. 437, 511
Patent Office, Congress and. Park Benjamin. 753
Patent-Office drawings, Board for. W. Heyes. 59
Patent Office practice, Defect in—Infringements. I. D. Kimball. 706
Patent Office—R. N. Flint's classification of internal-combusion engines. †398
Patent Office, Reforms needed in the. 715
Patents, Decision affecting—Monopolies. 356
Patents—The inventive microbe. New Yorker. 749
Patents vs. combined manufacturers, Licensees under; automobile patents. 550
Pattern. See also "Foundry."
Pattern and machine-mounted pattern, Loose. G. Buchanan. *728
Pattern may be improved by getting molder's ideas, How construction of. J. Wilson. *263
Core Wise. *415
Pattern mounting on molding machine. F. W. Hall. *39
Pattern numbers—General Electric practice. *797
Pattern plates—Bonvillain molding machine. *240
Pattern-shop experiences—Estimating; saving time; cooperation; apprentice's work; cheap job-shop pattern; "lost" pattern; selling twice; extra gear tooth for shrinkage. J. L. Card. 691
Pattern storage, Brown Hoisting Machy. Co.'s. *22
Patterns and drawings, Economy in; what draftsmen should know. Pessimist. 353
Patterns, Cylinder. H. S. Brown. *320
Patterns for draw-bench. *4
Patterns for split-pattern machine molding, Mounting—Tabor practice. F. A. H. *626
Patterns for Tabor hinged molding machine. *263
Patterns made of tin plate. *117
Patternmakers, Assembly drawings for. 818
Patternmaking—Nailing together for sawing. 511
Patternmaking of an automobile gas engine. E. F. Lake. *430
Paxson-Hall molding machine. *39, *100, 129
Pearl buttons, Making. Dixie. 281, 543
Pen-filling inkstand, Altneder's. *822
Pen, Ink retainer for. J. K. C. *248
Pencils, Origen of lead. *236
Pennsylvania State College shop course. †649
Pennsylvania, Univ. of — Engineering building. *525, 553, *593, *843, 618, 628, 818
Perforating machine, New. C. S. Jonas & Bros.' (Perfected by F. Hart.) *568, 647
Perpetual motion. See "Motion."
Perry's gas engines. 30
Peterboro, Ontario. F. A. H. 565
Philippine commerce, 1905 and 1904. 79
Phonograph—Machine-made alphabet. 418
Phonographic records of singers. 207
Phosphor-bronze springs. H. R. Gilson. 79
Photography in surveying deep bore holes. 716
Photography, Reducing maps by. 186
Photometer room, Univ. of Penn. *593
Photomicrographs, Cast-iron. *273, 389
Pickling castings. W. H. Cook. *420
Piece-work for apprentices. 669, 818
Piece-work, Molder's. C. T. Porter. 182
Piece-work system. Entropy. 646
Pile-driver force. D. B. Dixon. 448
Piles, Safe loads for. 367
Pin factory, Large Birmingham. 635
Pin working loose in bearing, Result of. *696
Pins, Nut-checking; checking link pins, etc. *214, *514, *773
Pins of automobile engines, Piston. E. J. Bartlett. *454
Pins, Wooden—Farm-engine repair. 355, 643
Pine island pump-plant test. 787
Pinion-cutting machine, Automatic. Eberhardt Bros'. *590
Pipe-bending machine, Automatic. Jacob Neuert's. *739
Pipe connected to exhaust, Steam. C. T. Porter. 830
Pipe cutter, Bignall & Keeler rolling. 622
Pipe hangers. G. E. Flanagan. *57
Pipe lengths in Europe. 225
Pipe, Molding submarine; Ward's joint. *636
Pipe post, The Erwood. *200
Pipe threads—British Standards Committee. 254
Pipe tools etc., Rack for. *189
Pipe unions—Hydraulic packings. *322
Pipe with spring for core, Bending. A. L. Hass. 24
Pipe wrench. Patterson, Gottfried & Hunter, Ltd.'s. *854
Pipe, etc., Machine for cutting off. *252
Pipes by coiling, Making gas. 519
Pipes, Effect of salt water on copper; protection boxes. A. H. Nourse. *579
"Pipes, Unions for Steam." W. H. Wakeman. †634
Piping—Hydraulic laboratory, Univ. of Penn. *597
Pistol barrel by hand, Rifling. W. L. McL. *351, *679
Piston cone bases meeting in middle; piston projection over admission ports. C. T. Porter. 831
Piston in hot cylinder, Fitting cold. 415
Piston molding at Manufacturer's Foundry. *429
Piston packings etc., Hydraulic. *322
Piston pins of automobile engines. E. J. Bartlett. *454
Piston-ring grinder. Graham Mfg. Co.'s. *650
Piston rings, Clamp arbors for. H. E. R. Manbrand. *678
Piston rings, Milling gap in; piston-valve-ring suggestion. A. L. Haas. 353
Piston-rod-thread gage. E. P. Clark. *60
Pitot tube, Moody's new method of reducing readings of; comparison with weir. W. M. White. *175
Pitot tube; flow of gases. *369, 407
Planes, Gliding—Deformation of metals. *395

PLANER.

—Angle, Planing device for master. *398
—Arc planing on gun sights. *732
—Bed with "Ferrofix," Brazing broken. 460
—Big work—Feed—Workman's idea. 579
—Cost-estimating slide rule. *803
—Crank-shaft, Machining "Mercedes." *330
—Cross-wind out of large planer, Taking. C. T. Porter. 607, 481
—Dirty job, Shirking. W. Osborne. 800
—Dog, Planer. O. *30
—Drives, Comparison of planer. W. H. Henley. *310
(Shifting-belt drive.) E. H. Waring. 598
—Hand wheels on planer. Entropy. 386
—"Jig," Plaster of paris. *727
—Leveling by water method. Cincinnatus. 773
—Planing piece too big for planer. F. F. F. 27
—"Practical Planer Kinks." Carroll Ashley. †419
—Side planer, Phoenix shaper and. 334
—Smith & Coventry's. C. T. Porter. 606
—Strength of planer. E. R. Plaisted. 677
—Tool on return stroke, Scheme for lifting planer. Artebe. *819
—Thin planing by Wm. Hollingsworth—Printing-press false beds. 465
—Tool action. H. I. Hannover. *193
—Tool holder, Multiple planer. H. E. R. Manbrand. *747
—Tools, Correct shape of planer. F. Rattek. *283
H. Cameron. *417
Planetary gears, John Edgar. *188
Nemo. *251
C. E. Steere. 352
F. H. Neely. *422
Y. K. *747
Planimeter and special applications, Polar. J. V. Wheatley. *75, *106
Planimeter, The Richard. A. Gradenwitz. *372
Plaster of paris, "Jig" made of. *727
Plate, A ground surface. 672
Plate, Making master angle. Jas. Dangerfield. *398
Plate, Schedule weights of steel and iron. Centrode. 318
Plates, Drilling pattern and transfer. *626
Plates, Planing chase. 465
Platform, Pattern-hoisting and conveying. *21
Plug for finishing jaw-holders. *16
"Plumbing Catechism." Ball and Sheriff. †285
Plunger-elevator plant test, Trinity building. A. J. Herschmann. 785

PAGE

Pneumatic. See "Air."
Pocket books, As to. 524, 678, 711, 849, 851
For rest of discussion see "Beams."
Points, Black-diamond turning. *86, *101
Pointing box-tool. Anthony. *680
Pole-piece bolts, Tension in. I. L. D. *680
Pole pieces, Punches and dies for. Persevere. *641
Pole punching, Press tools for. Persevere. 352
"Poles, Phantom of the." W. Reed. †35
Polishing hard rubber, ivory, etc. 382
Politics, Labor in. 418
Poor, Death of Geo. H. 460
Port Sunlight, Visiting. 751
Portland, Ore., as lumber port. 256
Post, Improved tool. F. Rattek. *614
Post-office engine. C. T. Porter. 830
Posts, Treating dead pine fence. 763
Postage, Deficient foreign. 583, 651, 736
Postage on second-class matter. 460, 465, 714
Postage-stamp-sticking machine. 457
Postal employees' wage increase. 682
Postal notes. 37
Potash kettle. Mfg. Equip. & Eng. Co.'s. *853
Pottery. Aging Chinese "crackled-ware." 382
Pottsville, Penn., Centennial of. 143
Powder factory, Dover, N. J., Gov't. 810
Powdered fuels; smoke abatement. 53, 434
Power calculations, Diagrams for automobile. Geo. Watson. *806
Power diagrams, Gasolene-engine. *834
Power, Land on which to use cheap. 356
Power, Liquid-air. 445
Power scale, Emerson. R. S. Brown. *83
Premium plan in Washington navy yard. 129
Premium system, Apprenticeship and. 669, 818
Premium system. Entropy. 646

PRESS.

—Armature-disk cutting press, Bliss. *716
—Automatic press, Bliss; safety stop. *209
—Chain, Making Locke Steel Belt Co.'s—Press, built-up dies, self-controlling reel, etc. *825
—Cutting strip metal to length in punch press. C. Petitjean. *83
—Die and forming tool for a clip, Blanking. W. H. F. *639
—Die, Extractor for shell-drawing. C. Petitjean. *708
—Die-slotting machine, Garvin. *459
—Dies, Bending. Cyclo. *29
—Dies, Split. H. E. S. *58
(Plenty of shear; sectional blanking dies.) H. E. Brown. *85
(Use on hard steel; fitting a wedge.) W. L. Hardy. 246
(Die beds or bolsters.) C. Petitjean. *282
—Dies etc.—keeping track of press tools. 83, 417
—Hand press. Carroll Ashley. *221
—Hydraulic press made from jack, Handy. Edw. Balbach. *416
—Hydraulic-press material; oil as working fluid. A. L. Haas. 90
—Iron-Clad Mfg. Co.'s plant. *114
—Notching fixture for punch press. C. Petitjean. *154
—Press, Inclinable power. Standard Mach'y Co.'s. *823
—Printing-press false beds, Planing. 465
—Punch-press table broken in two, Repairing. J. A. G. Goulet. *439
—Punches and dies for watt-meter-frame punchings; lining up, soldering, etc. R. A. Almond. *743
—Punches, Force necessary to strip work from; comparative friction with and without clearance; tests. H. D. McDonald. *543
(Proposed punch.) Conrad. *713
—Punching holes in block links of bicycle chains—Punch, die and jig. R. E. Weinland. *88
—Punching, Theory of. H. I. Hannover. *267, 357
—Punching work by confining in jig; shuttle die; chain links. R. E. Weinland. *545
Riggs. 709
—Punches and dies for pole pieces. Persevere. *641
—Punchings, Press tools for pole. Persevere. 352
—Rivets in soft sheet-steel parts, Forming; punch and die. G. K. Stevenson. *24
—Stamping work in shaper. J. E. P. *545
(Converting drill press into punch press.) E. DeHart. *770
—Stops for punch-press feeds—Stop and shear for disposing of the scrap; removing scraps of bicycle-chain side bars with air blast; a stop that failed. R. Earl Weinland. *314
—Tools for marking a sleeve, Press. Carroll Ashley. *119
—Tools for medical tablets, Making press. C. W. Seiler. *438
—Tools, Keeping track of press. T. Benson. 83
—Will Jopson. 417
—Wheel press, 90-inch Niles 600-ton hydraulic. *420
Pressure differences, Small — Flow of gases. S. A. Moss. *368, 407

PAGE

Pressure-effect experiments. H. I. Hannover. *189, *211
Pressure-plate patent. C. T. Porter. 481
Pressure readings, Water-turbine test. *170
Pressure, Water—New method of reducing Pitot-tube readings. *175
Pressures, Foundry-blast. W. H. Coleman. 437
Pressures, High steam. W. F. M. Goss. 808
Pressures of tubes, Collapsing. R. T. Stewart. *44, *764
Prices and wages, Gold. 255, 51
Prices, Machine-tool. 194
Prince, Alfredo. 823
Problem, Geometrical. E. H. Lockwood, Wm. Whaley, F. Trusjyuski, C. A. Kelley. *189, *414, 485, *643
Problems, Inventive. Leicester Allen. 22
Problems, Spiral-gear. *498, *463, 549, 772
Producer, Fichet and Henrtey's. *437
"Producer Gas, Catechism on." S. Wyer. †419
Producer-gas power plant. J. R. Bibbins. 779
Profiling fixture, Ideal die cam. *445
Profiling machine with belt drive, Pratt & Whitney 2-spindle. *650
Projectile—Action of capped armor-piercing shell. E. K. v. Thurnwerth. *164
Projectiles—Firth Stirling Steel Co. 685
Projectiles, Armor plate and. 81
Projections, Dimetric. Peter Palmer. *207
Propeller-blade nuts, Checking. *214
Propeller — "Die Schiffschraube." A. Achenbach. †195
Propeller, Machining a. W. Burns. 305
Propellers for use with turbines. 224
Protractor—Dyke's combination gage. *651
Protractor for engine shafts with two keyways. H. J. Chinneck. *153
Protractors, Combination triangles with. *248, *485
Providence public-library catalog. 634
Pulley. See also "Sheave," "Belt."
Pulley, Adjusting—not doing worthless work. 748
Pulley, Badly worn loose. W. Osborne. *696
Pulley bearings, Wear of. 675
Pulley grinder, Hollingsworth's home-made. H. J. K. *11, *469
Pulley, Latshaw steel split. *289
Pulley, Machine-molding cone. E. Ronceray. *62
Pulley oil holes, Loose. F. H. Sander. *283
Pulley, Temporary repair of large. L. L. Arnold. *89
Pulley widths, Tool for measuring. *122
Pulley with spiral oil groove, Mule. A. M. Gordon. *812
Pulleys—Comparison of planer drives. *310, 598
Pulleys, Rig for boring large. Repair Shop. *512
Pulleys—Rope drives. R. Hoyt. *518
Pump blunders. C. T. Porter. 184
Pump, Double-acting hydraulic-pressure. *242
Pump glands, Jig for drilling steam. 'Steam Pump." *816
Pump, Oil. F. R. Still. 769
Pump tests, Rotary—Neches Canal Co.'s irrigating plant at Pine island. W. B. Gregory. 787
Pump-valve seats—Deep-facing tool. *440
Pumps of Trinity building elevators. 786
Pumping by compressed air. J. Kelley. *203
Pumping engine at St. Louis Water Works. Record for duty established by Allis-Chalmers. 345
Punch. See also "Press."
Punch for brass shell, Multiple hand. J. T. *58
Punch. United Eng. & Fdy. Co.'s. *755
Punches, Force necessary to strip work from; comparative friction with and without clearance. H. D. McDonald. *543
(Proposed punch.) Conrad. 713
Punches of perforating machine. *571, 647
Punching, Theory of. H. I. Hannover. *267, 357
Punching work by confining in jig; shuttle die; chain links. R. E. Weinland. *545
Riggs. 709
Purdue faculty and equipment, Changes in. 552
Purdue impact-testing machine. *378
Purdue locomotive tests. W. F. M. Goss. 808
Purdue students to build railway. 701
Purdue timber tests. 531, 829
Puzzle, Boiler-shell. C. W. Eugene Pierce. *216
382

R

Rack cutter, Wolcott full-automatic. *285
Rack-cutting attachment for miller. Racquet. *577
Rack for pipe tools etc. J. J. Newbaker. *189
Rack, Improved drill. Joseph Stryhall. *217
Rack mechanism of calculating machine. *557
Radius cutter and holder. O. G. Simmons. *319

RAILROAD.

—Accident in receiving pit. 246
—Accident, Victims of English. 65
—Ballast, Mississippi sand gravel for. 491
—Boston subway ventilation. H. A. Carson. 784
—British Engineering Standards Committee. 389

PAGE

—Car-axle fractures from drilled holes. *635
—Car-ferry statistics. 394
—Cars for Berlin, 2-story. 16
—Cars, P. R. R. steel tunnel. 161
—Carwheel grinder, Norton. *411
—"Colossus of Roads"—Harriman. 648
—Electric road, German high-speed. 334
—Electricity in Washington tunnel. 848
—Government ownership. 387
—Grand Trunk right-hand running. 288
—Indian labor on Santa Fé. 417
—Lackawanna road and engineering ethics. 432
—Locomotive. See also "Locomotive" under main heading "Electricity."
—Locomotive-bolt-turning machine, Lassiter. *128
—Locomotive jobs in Chile—Setting valves; changing spring in tender; broken axle collar. Alfred Prince. 415
—Locomotive, Remarkable German. 284
—Locomotive tests, Purdue—Carnegie Institution—High steam pressures. W. F. M. Goss. 808
—Locomotive, Smoke consuming. 598
—Locomotive—Some peculiar machines. 123
—Locomotive springs, Testing. 64
—"Locomotive Tests." W. F. M. Goss. †128
—Locomotive with water-tube boiler. 842
—Locomotive work, Thermit welding in. 493
—Locomotive Works, Baldwin—"Record of Recent Construction, No. 59. †648
No. 58—Statue of M. W. Baldwin. †654
—Locomotive & Machine Co. of Montreal. 566
—Locomotives, F. W. Webb and English. 32
—Locomotives for Gt. Northern, Big Baldwin. 313
—Locomotives hauling cotton, Air. 837
—"Locomotives. Large Steam and Electric." J. E. Muhlfeld. †256
—Locomotives, Mechanical stokers for. 173
—"Locomotives, Pacific Type Passenger;" "Atlantic Type." Am. Loco. Co. †649
—Locomotives—Traction dynamometer—Precision springs. *702
—Master Blacksmiths' Convention. 163, †823
—Mexico, Railroad building in. 567
—Milan exhibition—Historic rails; Hanover locomotive with unusual valves; cars, etc. 269, 231, 842
—Mountain railways. B. W. Kennedy. 701
—Pack saddle on wheels; monorail. 162
—P. R. R.—N. Y. station; Atlantic City line; wage increase. 427, 534, 663
—P. R. R.'s use of screw spikes. 822
—Purdue students to build railway. 701
—Rails found, Buried. 357
—Rails, Properties of; approximating sectional area by balancing, etc. F. E. Cardullo. *849
—Signal, Snake in a. 195
—Rochester, Syracuse & Eastern elec. ry. 673
—Southern Pacific's technical school. 606
—Telephones on freight trains. 253
—Ties, Steel; tie statistics. 345, 412
—Time-tables, Russian railway. 682
—Wash., Balt. & Ann. R. R. for single-phase electric traction, Equipment of. 638
—Wheel press, Large Niles hydraulic. *420
—Wrecked and taken back, Lathe. 756
Rambler automobile works, Concrete construction at. *199
Rand Drill Co., Canadian. 564, 566
Range dials and strips for navy guns, Graduating. *425, *740
Rapping device, Molding-machine. *41
Rapping-plate, J. F. Dawe's. *36
Ratchet wrench. Patterson, Gottfried & Hunter, Ltd.'s. *854
Read, Why mechanics do not. Pessimist. 156
Entropy. 386
(Editorial.) 456
(Note.) 713
Stationary Engineer. 747
Readers, To our—Help wanted. 714
Ream holes in links, Unable to. *88
Reamer centers, Garvin 8-spindle. *228
Reamer, Expanding. C. W. Putnam. *581
Reamer, for cylinders, Expanding. C. W. Putnam. *383
Reamer holder for turret lathe, Floating. I. Green. *580
Conrad. *745
Reamer, McCroskey universal adjustable. 621
Reamer, Stepping and relieving Hanson taper. *234
Reaming gun barrels, Feeds in. 122
Reaming jig, Drilling and. E. Klaps. *350
Reaming jigs; durability of reamers *615
Reaming operations on Almond chucks. *502
Receivers, Steam. C. T. Porter. 335, 339
Recessing attachment for miller, Facing and. H. E. R. Manbrand. *384
Recessing tools, Lovekin tube-sheet. *259
Reciprocity, E. N. Foss on. 105
Record, Shop drawing. *814
Recorder, Mechanical time. Bristol Co.'s. *620
Recorder type-wheel tools, Time. *12
Reed, Death of Sir Edw. J. 757
Reedy foundry practice—Automobile cylinders. *138
Reel, Chain press with self-controlling. *825
Reference-board attachment. S. B. *249
Reflection in watch case. Pedro. 710
Regulating valve, C. T. Porter's. *335
Rejtoe's researches on inner friction. *244, *363, *395

PAGE

Release for bench lathe, Quick. *31
Relieving machine, Pratt & Whitney engine lathe as a; various kinds of work. F. O. Hoagland. *231
Remington, Death of Geo. W. 824
Remington typewriter bonus. 33
Reminiscences, Engineering. C. T. Porter. *182, *335, 478, *606, 714, *830
Repair ship, English naval. 755
Repair—Wooden brasses. A. L. Haas. 419
Repetition and jobbing methods. Junior Boss. 816
For connection see "Specialist."
Reservoir calculations by planimeter. *77
Resistence law etc., Kick's proportional. *211, *244
Resistence of ships—Experimental tank. *449
Rest, Attachment for bench-lathe slide. F. J. LeCard. *387
Rest for bench lathe, Ames slide. *36
Rests in grinding, Use of steady. *308
Rests of LeBlond lathe, Roughing. *737
"Revolution," Turbine yacht. 224
Reynolds, Death of Dexter. 290
Rice, Calvin W. 34
Ridgway Machine Tool Co. 713
Rifle barrel, Drilling bullet in. 354
Rifling pistol barrel by hand. W. L. McL. (Rifling rifle barrel.) T. R. H. *351 *679
Rigid materials, No—Fortunately. 98
Ring, Drilling—Jig work. *50
Ring, Forging copper. A. Smith. (Making steel rings.) Entropy. *159 386
Ring to take thrust on collar. *213
Rings, Broaching brass. H. E. R. Manbrand. *247
Rings, Clamp arbors for piston. H. E. R. Manbrand. *678
Rings from square or flat iron bent edgewise, Formulas for constructing. S. Uren. *496
Rings, Manufacture of friction-clutch. Tangent. *746
Rings, Milling gap in packing; piston-valve-ring suggestion. A. L. Haas. 353
Rivets, Dimensions of. 299
Rivets in soft sheet-steel parts, Forming. G. K. Stevenson. *24
Riveter casting, Large hydraulic. 367
Riveting—Boiler-shell puzzle. *216, 382
Road resistances, Table of. Geo. Watson. *806
Roads, Automobile. W. H. Booth. 685
Roc Steel Castings Co. 98
Rock-arm problem. *189, *414, 485, 643
Rockefeller's views on limiting opportunities. 649
Rod bolts, Tightening connecting. 486
Rod-box boring machine, Double connecting. C. T. Porter. 606
Rod brasses, Jigs and fixtures for machining automobile connecting. "Triple Auto." *742
Rod-grinding machine, Hans Renold, Ltd.'s special. I. W. Chubb. *229
Rod in large lathe, Turning small. W. L. McL. *711
Roll grinding. H. F. Noyes. 187
C. H. Norton. 489
Roll, Turning sponge. H. D. Pomeroy. 514
Rolls, Action of. H. I. Hannover. *212
Roller bearing. See "Bearing."
Rollers, I-beam-trolley. *745, *778, *551
Rolling-mill-engine continuous cards. *673
Rolling-mill engines, C. T. Porter's. *335, 478, 610, 714
Rolling seam on range boiler. *119
Roof, Construction of cottage. Entropy. 251
Roof construction, Ferroinclave. A. E. Brown, et al. 789, *22
Roof construction, Reinforced-concrete. *403
Roof construction, Saw-tooth skylight in factory. F. S. Hinds, with A. S. M. E. discussion by Prof. Sweet et al. 787
Roof of Rambler concrete shops. *199
Roofs for factories, Saw-tooth. K. C. Richmond. 789
Rope drives. R. Hoyt. *518
Rope, Wire. 824
Roses, Iron. *721
Rotating shaft 180 deg. without dead center. E. J. Lees. 161
Rounding emery wheels. Ike. *84
Rubber, Machining and polishing hard. 382
Rubber substitute, W. T. Carr's. 740
Rubber tires and springs. W. H. Booth. 685
Rubber, Turning and boring. Wm. Clark. A. Greaser. *440 616
Rule, Approximating value of fraction with. *499, *464, 549
Rule, Educational metric. Lufkin Rule Co.'s. *631
Rule, Slide. See "Slide."
Ruler—Parallel-motion straight-edge. *60
Russia, Engineering industries in. C. P. Fuller. 602, 632, 659
Russian markets. F. C. C. 447
Russian railway time-tables. 682
Rusting of wrought iron and steel. 49

S

Safe companies, Legal note relating to. 727
Safety attachment, Engine. W. Osborne. *69
Safety-device fallacies, Fly-wheel. 391
Safety devices, Exposition of. 288, 612
Safety, Factors of—Tube tests. *47, *764
Safety stop, Bliss automatic-press. *209
Safety, etc., Factors of. Entropy. 251
Sage, The sageness of. 227
Salary of man of unusual ability. W. Osborne. 723
Salaries, English draftsmen's. 87, 355
Salaries of Government employees, Computing. 148
Sales department, Iron-Clad Mfg. Co.'s. *114
Salesmen, International Correspondence Schools'. 585, 588
Salt by pressure, Deformation of rock. *191
Salt-water effect on copper pipes. *579
San Francisco, Graft in. 683
Sand-blast apparatus, Hoermann's. 521
Sand distributor and revolving sand frame for Bonvillain molding machines. *376
Sand in engine frame, Core. *769
Sand mixer, Stockham. 257
Sand, Pickling castings to remove. *420
Sand-rope-spinning machine patent. 91
Sandy Hook, A. S. M. E. at. 791, 821
Sanitary appliance, A novel. *22
Saw arbor, Cheap. C. A. Trask. *213
Saw cutting-off machine, Espen-Lucas cold. *87
Saw, New way of using power hack—Cutting head off crank-shaft, Hoefer Mfg. Co. 100
Saw, Robertson double power hack. 390
Saw sharpeners exhibited at Milan. 333, 334
Saw-tooth roofs for factories. K. C. Richmond. 789
Saw-tooth skylight in factory-roof construction. F. S. Hinds, with A. S. M. E. discussion by Prof. Sweet et al. 787
Saw troubles and remedies, Hack—Sawing into end of piece bent over; holding short stock. Cyclo. *544
Sawing machine, Simplex filing and. *692
Sawing machine with special table vise, High Duty cold. *716
Sawmill engines at Centennial, Allis. 183
Sawmill engine, Mistake erecting. W. Osborne. 799
Scale, Emerson power. R. S. Brown. *88
Scales for stock taking. *122
Scales, Natural; use of scales; drawing design to scale. C. P. Fuller. 810
Schieren Building tablet, Unveiling of. 592
"Schiffschraube, Die." Albert Achenbach. †195
School. See "Education" and schools or colleges by name.
Schreiner, Death of Friederich. 619
Science, Engineers and. B. W. Kennedy. 698
Scrap Mfg. Co. M. MacMichael. 733
Scrap pile, Utilizing. W. Osborne. Dixie. 280 354
Scraps by stop and shear and by air blast, Disposing of punch-press. *315

SCREW.

See also "Worm," "Propeller," "Tap."

—Bolt-threading machine. C. T. Porter. 607
—Clamping tail spindle. *513, 675, *676
—Die, Manufacture of the Ideal opening. F. A. S. *442
—Dies with end mill, Throating. A. B. Ginner. *220
—Efficiency of screws; table. J. W. Bramwell. 644
—Locking screws for piston pins. *455
—Machine screws, Report of A. S. M. E. committee on standard proportions for. *471
—Measuring machine, Micrometer screws of. *135
—Nut-checking devices. *214, *514, *778
—Relieving hobs, thread-milling cutters etc. on engine lathe. *232
—Screw heads and hexagon nuts, Fixtures for milling. Cyclo. *439
—Screw machine. See also "Lathe" (subentry "Turret.")
—Screw machine, Box tool for automatic. W. Loach. *28
—Screw-machine cam, B. & S. automatic. *72
—Screw machine, Rapid work on automatic. 58
—Screw machine, Spring chucks for. *745
—Screw-machine tools for machining brass type-wheels; making expanding chuck, etc. *12
—Screw machine, Triple cutting-off tool for. H. E. R. Manbrand. *744
—Screw-machine work on Ideal die. *443
—Screw machines at Cleveland Automatic Mach. Co.'s plant; large work; interchangeable feed bracket, etc. *20
—Screw machines, Setting automatic. F. A. Stanley. (Setting-up print for B. & S. machine.) McK. 59 *215
—Screw without lathe or die, Cutting long square-thread. Dixie. *94, 354
W. Osborne. 280
—Screws and nuts for automobiles, Standard. Gerald. *706
—Spikes, Use of screw R. R. 822
—Thread drawings etc., Screw. *217, *349, 387, 513
—Thread gage, Piston-rod. E. P. Clark. *60
—Thread miller, Cutter-head mechanism of Pratt & Whitney. A. E. Teherniak. *495
—Thread-milling machine, Pratt & Whitney taper attachment for. *652
—Thread, Ruining lathe-spindle. 756
—Threads as used in buildings. 399
—Threads—British Standards Committee. 254
—Threads for electrical apparatus, Standard screw. J. W. Upp. 63
—Threaded mandrels, Removing delicate work from. *153
—Threading Almond drill chuck. *503
—Threading cutters, High-speed-steel jaw. 68
—Threading tool, Home-made. W. L. McL. *711
Scriber points, Hardening. Kurt Stoye. 814
Seams, Machine for making "cold-weld"; rolling seam on range boiler. *118
Searchlight at Lake Geneva, Powerful. 364
Seats for machinists. See "Sit."
Seattle in 1909, World's fair at. 810
Second-hand vs. new machine tools. 484
Secretary, A. S. M. E., New. 34
Section liner, Graduated. A. J. W. *772
Sections, Cross—G. E. practice. *798
Security—Exposition of safety devices. 288, 612
Selden patents. 550,667
Selfishness and system. M. MacMichael. 734
Selling machinery, Increased cost of. 491
Selling Magazine. †576
Selling tools—Unjust claims on builders. 756
Separator, Burlin's magnetic. *822
Separators, Cream. W. Osborne. 662
Setting automatics. F. A. Stanley. McK. 59 *215
Shaft, Crank. See "Crank-shaft," "Counter-shaft."
Shaft deflection of big water turbine. *172
Shaft, Filing—Curing hot bearing. 642, 772
Shaft hangers to concrete buildings, Attaching. *697
Shaft, mistake in keyseating; faking. 750
Shaft, Straightening large. E. C. Wills. Geo. Letherland. *156 438
Shaft while grinding, Supporting a. *308
Shaft 180 deg. without dead center, Rotating. E. J. Lees. 161
Shafts, Drilling and assembly jig for hubs with flat arms on. *316
Shafts for carrying sliding gears, Design of. Warren Noble. *257
Shafts for different speeds, Rigidly connected. 316
Shafts, Protractor for engine. *153
Shafts, Substitute for shoulder on. *213
Shafting, Lining; fitting coupling. W. Osborne. 662
Shaper and side planer, Phoenix. 334
Shaper, Fixture for holding rectangular work in. Cherry Red. *680
Shaper, keyseating tool for. Herman Jonson. *187
Shaper, Open-side. Cincinnati Shaper Co.'s. *853
Shaper, Rockford 20-inch back-geared, crank. *458
Shaper, Stamping work in. J. E. P. *545, *770
Shaper-work cost by slide rule. *803
Shear. United Eng. & Fdy. Co.'s. *755
Shearing experiments. H. I. Hannover. *266, 357
Shearing strip metal—Punch and die. *83
Sheave-pulley casting made by sweeping. *25
Sheave, Reboring large. H. D. Pomeroy. 676
Sheaves—Rope drives. R. Hoyt. *518
Sheet-metal department, Electrical works'. *374
Shell, Action of capped armor-piercing. E. K. v. Thurnwerth. *164
Shell-drawing die, Extractor for. C. Petitjean. *708
Shellac chuck. Robt. Grimshaw. *30
Sherbrooke, Que., Industries of. 566
Ship. See also "Navy," "Turbine," "Boat," "Propeller," "Exposition," "Marine" and ships by name.
Ship "Adriatic," Engines of. 186
Ship—Boring cylinder; piston sticks. 415
Ship, English naval repair. 755
Ship—General Uhler on steamboat inspection; H. J. Hartley on recent Cramp boilers; superheated steam. 453
Ship "Governor Cobb," Turbine. 658
Ship—Indicator cards; wooden brasses. 419
Ship—Largest Lake-ore cargo. 610
Ship—Marine applications of Curtis turbine. *224
Ship story—A "steam trap." Dixie. 487
Ship tank of University of Michigan, Experimental; model-cutting machine; drawings; dynamometer; calculation of resistance. H. C. Sadler. *449
Ship—Tightening bolts; crank-shaft repair. *486
Ships, Some modern steam. 35
Ships, The Largest. 65
Ships' officers, New London Marine Iron Works' lounging room for. 410
Shipbuilding, Government and. 81
Shipping, Prizes for essays on. 412
Shock, Resistance of wood to. 829, 531
Shop accidents. 34, *186
Shop associations. See "Apprenticeship."
Shop at Lynn, Apprentices'. 840, 852, 781
Shop building—Hydrostatic level. 635, 773
Shop conditions—Seats. 850

PAGE

Shop construction, Reinforced concrete applied to modern; Taylor-Wilson Mfg. Co.'s shop; effect of fire on an unfireproofed structural-steel shop, etc. E. N. Hunting. *400
Shop course, Penn. State College. †649
Shop, English floating machine. 755
Shop experiences, Pattern. J. L. Gard. 691
Shop floors made wrong. R. J. D. Entropy. *216 386
Shop house-warming—Jones Speedometer Co. 715
Shop injured by objection to trolley. 783
Shop, Keeping track of drawings in machine. A. J. W. *814
Shop management, Economy in. D. C. Eggleston. 627
Shop notes, Middle West—Acme Machy., Warner & Swasey, Cleveland Automatic Machine and Brown Hoisting Machy. Co.'s. *17
Shop of Whitney Mfg. Co. 713
Shop, Old stage-coach. H. M. L. 577
Shop-order and time-keeping system, Le Blond. W. T. Harris. *312
Shop, Permitting visitors in the shop. H. L. Whittemore. 751
Shop products of U. S. 548, 673
Shop-roof discussion—A. S. M. E. 787
Shop, Some specialties of a Baltimore—Wm. Hollingsworth's. H. J. K. *465, *11
Shop—Specialist vs. all-around man. See "Specialist."
Shop specifications, Blue prints for. H. F. Noyes. *174
Shop, Starting a. Entropy. 412, 748
(Cash or credit.) Dixie. 581
(Three successful experiences.) Neralcm. 615
A. Greaser. 616
Shop tools and methods. F. J. LeCard. *50, *305
Shops big and little; Scrap Mfg. Co., system and lack of it. M. MacMichael. 733
Shops, Burroughs Adding Machine Co.'s *697
Shops, Canadian—Westinghouse Co.; International Harvester Co.; London M. T. Co.; Rand Drill Co.; Massey-Harris Co.; John Bertram & Sons Co.; Canada Foundry Co.; General Electric Co.; Locomotive and Machine Co. of Montreal; Allis-Chalmers-Bullock Co.; Dominion Bridge Co.; Jenckes Machine Co.; Robb Engineering Co.; Dominion I. & S. Co. et. al. F. A. H. 564
Shops, Choice of men and choice of. 490
Shops, Cincinnati Machine Tool Co.'s new. *689
Shops, Concrete construction at Rambler auto. *199
Shops, John Cockerill, E. Guarini. *110
Shops of Companie Internationale d'Electricité. *373
Shops of Dean, Smith & Grace, Ltd. *291
Shops of Iron-Clad Mfg. Co. *114
Shops of Univ. of Penn.—Foundry, wood-working, machine, forge; methods, etc. *525, 553, *593, *843, 618, 628, 818
Shops, Russian. C. P. Fuller. 602, 632, 659
Shoulders, Substitute for shaft or arbor. *213
Shrink fits. John E. Sweet. 851
Shrinkage, Extra gear tooth for. 692
Shuttle die, Punching work in. *545, 709
Sieve, Obermayer "Rockwell Riddle" foundry. 755
Sights, Finishing arcs on naval gun. *731
Signal, Snake in a train. 195
Signaling, Submarine. H. R. Gilson. 163
Silicon percentage, Crushing strength and. *273, 389
Sit while working? Should machinist. By George. 850
Sketch books—G. E. practice. 798
"Skizzieren von Maschinenteilen in Perspektive, Das." Carl Volk. †35
Skylight in factory-roof construction, Saw-tooth. F. S. Hinds. 787
Skylights of Rambler concrete shops. *200
Slate, Death of Dwight. 198
Sleepy Eye engine. Kiowa. *580
(Also 471, Vol. 27, pt. 1.)
Sleeve, Press tools for marking a. Carroll Ashley. *119
Slide rest. See "Rest."
Slide rule, Cost-estimating. W. L. Miggett. *802
Slide rule, F. W. Taylor's use of. 774
Slide rule, Finding approximate fractions with. 500, *464, 549
"Slide Rule, The Runnerless." F. F. Nickel. †256
Slide-rule winkles—Multiplication, division, decimal point, trigonometric functions. C. G. Richardson. 92
Slot machine to sell tickets. 272
Slots in blower rotor, Milling. *467
Slotting boring bars for cutters. *351, *544, *642
Slotting machine, Garvin die. *459
Slotting machine, Newton portable. *491
Slotting machine, Old. I. P. Morris works. *394
Smelting of iron and steel, Electric. 658
Smith, Death of Earl A. 168
Smith of Smith & Coventry, Mr. 335
Smoke-abatement problem. W. H. Bryan. 52
Smoke and its abatement. C. H. Benjamin. 433
"Smoke graphite." 751
Smoke Inspectors, National Association of. 111

PAGE

Smokeless combustion in Cleveland. *22
Smokeless furnace for bituminous coal. 779
Snake stops railroad train. 195
Soap factory, Visiting. H. L. Whittemore. 751
Social Service, American Institute of. 288, 612
Social statistics and dynamics, Laws of; Huxley's views, etc. 618
Socket for broken-shank drills. C. R. McGahey. *747
Socket, Machining steering-gear. Nomad. *59
Soda and potash kettle. Manufacturing Equip. & Eng. Co.'s *853
Soda-water fountains, Making. 118
"Softening Feed-Water." E. Wehrenfennig. †492
Soldering and brazing without heat. T. R. Hassell. 217
Dixie. 355
Soldering, Beeswax mixture for. 744
"Soldering, Brazing and." J. F. Hobart. †419
Solids with planimeter, Computing. *106
South African Colonies' tariff. 243
Southwark Works experience. C. T. Porter. 478, *606, 830
Space, Our study of. 162, *131
Spain's tariff against emery products. 805
"Spanish, Dictionary of Engineering Terms in English and." A. J. R. V. Garcia. †285
Spanish duty on typewriters. 149
Sparring machine. 119
Specialist vs. all-around man. Jack and Would-be Master of One Trade. 515, 25, 158, 187, 313, 318, 319, 578, 640, 679, 771, 816
Specialization in Russian shops. 604
Specific heat of superheated steam. 780
Specifications, Blue prints for shop. H. F. Noyes. *174
Speed. See also "Tachometer," "Drive," etc.
Speed box of Morris radial driller. *767
Speed-change device. L. F. B. *121
Speed diagram, Le Blond lathe cutting. *737
Speed-governing-device fallacies. 391
Speed of motor vehicles, Diagram for. E. H. Remde. *513
Speed retardation, Frictional tests by. *505, *535
Speed variator, Harding hydraulic clutch and. 259
Speed with high-speed steels. 67
Speed, etc.—Cost-estimating slide rule. *802
Speed, etc.—Planer-drive comparisons. *310
Speeds and feeds, Turning. 299
Speeder, Drill. Graham Mfg. Co.'s 622
Speeding up, Saving money and time by. Entropy. 647
Spelling, Our antiquated methods of 549
Spelling, Simplified. 357, 418, 626, 647, 730
Spherical-turning fixture. Gerald. *543
Spikes, Use of screw. 822
Spindle, Clamping tail. W. S. Leonard. *513
E. H. Fish. 675
W. L. McL. *676
Spindle, Offset drill. J. W. McFarlane. *92
Spindle ruined, Lathe—Unjust claims. 756
Spindle work, Small. G. Buchanan. *25
Spindles, Fixture for cutting oil grooves in. *542
Spindles of Wolcott rack cutter. *285
Spindles, Size of lathe. Instructor. 705
Spiral curves, Fenn's instrument for drawing. *67
Spiral gear. See "Gearing."
Spiral work, Home-made boring-mill rig for. W. L. McL. *160
Splices for belts, Cement. *309, 455
Split dies. *58, *85, 246
Sponge roll, Turning. H. D. Pomeroy. 514
Spring for core, Bending pipe with. 24
Spring, Holding cutter with. *305
Spring tension for handle, Simple. M. MacMichael. *817
Spring wheels, Automobile. W. H. Booth. 685
Springs, Early elliptical carriage. H. M. L. 578
Springs of iron fence wire, Making. W. L. McL. 514
Springs, Phosphor-bronze. H. R. Gilson. 79
Springs, Precision dynamometer. A. H. Emery, Jr. *702
Springs, Review of formulas for helical. O. A. Thelin. *847
Springs, Testing locomotive. 64
Springs, Winding long. J. Bertram. *250
Springs with table of loads and deflections, Notes on helical wire. F. D. Howe. 808
Square, Knife-edge. *58
Squires, Death of Cyrenius N. 290
Stack lining broken—What to do. 677
Stage-coach factory, Old. H. M. L. 577
Stamp mill, A noteworthy. 573
Stamping work in shaper. J. E. P. *545, *770
Stand while working? Should machinist. 850
Standard machine screws, A. S. M. E. committee report on. *471
Standard measure bars, Method of Comparing. L. A. Fischer. *547
Standard screws and nuts for autos. *706
Standards and standard practice. 619
Standards circular, Bureau of. †87
Standards committee, Work of British. 254, 389
Standardization of parts—foreign trade. 637
Standardized? Cannot symbols used in formulas be. W. Osborne. 709

PAGE

Starting shops. Entropy et. al. 412, 581, 615, 748
Statue in Philadelphia, Baldwin. 654
Steadies in grinding shaft, Use of. *308
Steam in Venturi tube, Flow of. 785
Steam jets; smoke abatement. 53, 435
Steam laboratory, Univ. of Penn. *531
Steam on shipboard, Superheated. 454
Steam—Overheated and superheated. 195
Steam plant of the White motor car; specific heat of superheated steam, etc. R. C. Carpenter. 780
Steam pressures, Results of investigation into use of high. W. F. M. Goss. 808
Steam receivers. C. T. Porter. 335, 339
Steam, Superheated; water of condensation. 389
Steam trap, A. Dixie. 487
Steam Traps, Wakeman's pamphlet on. †794
Steamship, Steamboat. See "Ship" and cross references, "Boat," "Turbine," etc.
Steel alloys, Vanadium. 134
Steel and iron plate, Schedule weights of. Centrode. 318
Steel, Annealing tool. K. T. Gifford. 680
Steel at low temperatures, Strength of—Watertown-arsenal tests. 203
Steel billets, Sizes of. 140
Steel boiler plate. H. J. Hartley. 454
Steel, British output of bessemer. 606
Steel business, Some demands of tool. 520
Steel, Effect of fire on structural. *401
Steel for motor-car construction. 846
"Steel, Helpful Hints on Hardening." J. W. Bennett. †649
Steel, High-speed—Uses, cost of tools, special conditions, drilling, speed, power, testing, etc., by W. I. Sears; milling, jaw-threading cutters, hardening, etc., by Eugene Childs. 67
"Steel, Hints to Practical Users of Tool"—Seebohm & Dieckstahl's. †802
Steel in concrete, Bedding. 125
Steel, Le Blond shop cards for. *313
Steel making, Carnegie Co. and bessemer. 728
Steel manufacture, Influence of Government on. 81
Steel manufacture, Use of vanadium in. B. E. D. Stafford. 469, 453
Steel—Microscopic study; resistence to impact. *394
Steel milling cutter which broke in hardening, "High-speed." *87
Steel output, Bessemer and open-hearth. 469
Steel, Relative corrosion of wrought iron and. 49
Steel sections, Weights of. 160
Steel, The manufacture of tool—First tool steel; blister steel; Siemens-Martin furnace; Swedish and American irons; nitrogen; the crucible-steel maker; tool-steel "mixes;" advent of high-speed steel; carbon and tungsten; low heat for carbon steel; future of crucible-steel making. E. T. Clarage. 573
Steel tubes, Collapsing pressures of. *44, *764
Steel with cyanide, Tempering Novo. Carroll Ashley. 216, 639
"Common Sense." 352, 614
J. F. B. 486
(Use of kerosene.) 352, 639
(Avoiding scale; applying the cyanide; a substitute; why some tools will not harden.) Riggs. 773
(Mr. Ashley's bushing; suggested experiment; high-carbon steel hardened in water; distortion of carbon steel; keeping track of stock.) W. L. Hardy. 814
"Steel Worker, American." E. R. Markham. †285
Steels, Care in buying foreign tool. 663
Steels, F. W. Taylor on tool; A. S. M. E. discussion. 774, 820
Steels, Properties of "ternary." R. Grimshaw. 377
Steering-gear part, Machining automobile. Nomad. *59
Stensland, Mechanical interests of. 429
Stevens Institute Alumni Directory. †398
Stevens Institute, Morton Memorial laboratory. 196
Stock keeping. M. MacMichael. 735
Stock-taking tools. *122
Stockholders, To publish names of. 732
Stockholders' obligations—Use of trade name. 727
Stokers, Mechanical; smoke abatement. 53, 434
Stokers for locomotives, Victor mechanical. 173
Stones, Turning mill. W. L. McL. 708
Stool. Standard drawing. Univ. of Penn.'s. *595
Stools by machinists, Use of. 850
Stop, Bliss automatic-press safety. *209
Stop, Gas-engine. W. Osborne. *69
Stops for press-punch feeds. R. Earl Weinland. *314
Storage, Brown Hoisting Machy. Co.'s pattern. *22
Storage, Casting. Cincinnati M. T. Co.'s. *689
Storage of coal under water. 398
Storing tools. L. A. Murray. *801
Straight-edge, Parallel-motion. F. W. Harris. *60
Straight-edges, Knife-edge. *58

PAGE

Straightening gun barrels—Boring. 122
Straightening large shaft. E. C. Wills. *156
Geo. Letherland. 438
Stainers for casting, Tin. *428
Strength. See also "Test," "Beams."
Strength of framed structures *270, *611
"Strength of Materials." Slocum and Hancock. †649
Stresses in balance-wheels, Minimizing shrinkage. W. Osborne. 27, 359
Geo. F. Maddock. 160
Strikes in Russia. C. P. Fuller. 660
Strip from punches, Force necessary to. *543, *713
Strip metal to length in punch press, Cutting. C. Petitjean. *83
Strips, Graduating range. J. J. Strong. *740
Structure, Tallest human. O. Sangstad. 578
Structures, Economy of material in framed. F. R. Honey. *270, *611
Structural notes. 125, 299, 348, 367
Structural steel and reinforced concrete. *400
Structural work—Engineer and civilization. 700
Studs, Checking nuts on gland. *214
Submarine signaling. H. R. Gilson. 163
Subscription agent imprisoned, Fraudulent. 715
Subway ventilation, Boston. L. A. Carson, C. H. Churchill, L. H. Woodbridge et al. 784
Suggestions from AMERICAN MACHINIST. 157
Superheat—White motor car; specific heat. 780
Superheated, Overheated and. 195
Superintendant, New. C. T. Porter. 609
Suplee, H. H., Buys *Cassier's Magazine*. 753
Suplee's position on metric system. 671, 790
Supply and Machinery Dealers' Asso., Detroit meeting of National. 491
Surface plate, A ground. 672
Surfacing and boring lathe, Dean, Smith & Grace, Ltd.'s high-speed. *295
Surveying deep bore holes, Photography in. 716
Surveying instrument, Artist's conception of. 647
Swaging machine, Job for the heavy; quarter-twist fixture, etc. A. Smith. *208
Swasey as amateur lecturers, Warner and 822
Sweeps for small work. G. Buchanan. *25
Sweet's artisan school, Prof. 226, 314, 318
Swindle, *U. S. Trade Reports*. 227
Swindler sent to prison, Subscription. 715
Swiss turbine practice, American and. 194
Symbols—Code words. C. R. Harris. 815
Symbols used in formulas be standardized? Cannot. W. Osborne. 709
System, A. S. M. E. discussion on. 777
System and lack of it. M. MacMichael. 733
System—Economy in shop management. 627
System for recording drawings in shop. *814
System—Keeping track of press tools. 83, 417
System, Le Blond shop-order and time-keeping. W. T. Harris. *312
System of indexing and numbering tools. L. A. Murray. *800
System, Taylor—Time and cost keeping. *761
Systematic economy. See "Drawing."

T

Table engine exhibited by Brazil. 185
Table of spring loads and deflections. 808
Table, Reference board on drawing. *249
Table, Repairing punch-press. *439
Table, Standard drawing. Univ. of Penn.'s. *594
Tablet, Unveiling of Schieren Building. 592
Tablets, Making press tools for medical. C. W. Seiler. *438
Tabor hinged molding machine. *261
Tachometer, Cut meter as. R. S. Brown. *83
Tachometer, Empire Machine Co.'s 243
Tachometer, Veeder. 66
Tachometer, Vibrating. *507
Tail spindle, Clamping. W. S. Leonard. *513
E. H. Fish. 675
W. L. McL. *676
Talking machine records of singers. 207
Tangye, Death of Sir Richard. 553, 612
Tank at Presall, Water-measuring. *205
Tank casting, Flushing. *240
Tank, Molding. H. J. McCaslin. *500
Tank of Univ. of Mich., Experimental ship. H. C. Sadler. *449
Tank, Pickling. W. H. Cook. *421
Tanks, Pressure, weir, weighing and immersion. Univ. of Penn.'s *597, *598, *599, *601
Tantalum by "squirting" process, Working. 244
Tap, Collapsible. *551
Tap on engine lathe, Correcting lead of. *232
Taps—Report on standard screws. *471
Taps continued under "Tapping."
Taper attachment for thread-milling machine, Pratt & Whitney. *652
Taper, attachment, Improvised. T. Tanyard. *30
Taper holes, Gage for. Gerald. *709
"Tapers, Turning and Boring." F. H. Colvin. †648

PAGE

Tapping machine, Newton radial drilling and. *326
Target, Steel floating. 626
Tariff changes, Japanese. 497
Tariff—E. N. Foss on reciprocity. 105
Tariff—Free art importations. 519
Tariff, New Italian. 457
Tariff on brass catches and clasps. 501
Tariff on harvesting machinery, Australian. 265
Tariff—Russian duty on bicycles. 371
Tariff, South African. F. C. C. 243
Tariff, Spanish. 372
Tariff against emery products, Spain's. 805
Tariff on brass and clasps. 501
Taximeters needed here. 65
Taylor system, Cost and time-keeping outfit of the. F. A. H. *761
Taylor-Wilson Mfg. Co.'s plant. *401
Technical education. See "Education."
Technical English, etc. Dixie. 644
Technical Publicity Association. 822
Technolexicon, The. 123
Telephone directory, New York. 97
Telephones on freight trains. 253
Telephony in Japan, Government. 757
Telescope, Naval Observatory, Machinery of big. C. H. Claudy. *131, 162
Temperatures, Strength of steel at low. 203
Tempering Novo steel with cyanide. Carroll Ashley. 216, 639
"Common Sense." 352, 614
J. F. B. 486
(Use of kerosene.) 352, 639
(Another hardening mixture.) Riggs. 773
W. L. Hardy. 814
Tempering sprocket chain. F. A. S. *828
Templets together, Holding edges of thin. Winamac. 56
Tennessee river power; land values. 356
Tension experiments. H. I. Hannover. *244
Tension for handle, Simple spring. M. MacMichael. *817
Tents at N. C. R. camp. *362
"Termini" or "terminals." 283
"Ternary" steels, Properties of. R. Grimshaw. 377
Test bar and block. Knife-edge. *58
Test for hardness, Brinell ball; diagrams of parallel tests of hardness and tensile strength. *73
Tests at Presall, Air-lift. *203
Tests by H. Diederichs, Cast-iron crushing and tensile; report on micro-structure by Albert Saveur. W. J. Keep. *273, 389
Tests, Cast-iron-beam. *54, 91, 222, 249, 282, 384, 385, 522, *652, *676, 677, 711, 712, *813, 818, *849, 851
Tests—Collapsing pressures of tubes. *44, *763
Tests, Engineering-school. C. E. Lucke. 297
Tests—Experimental technology of deformation of materials and its application to metal-working processes. H. I. Hannover. *189, *211, *244, *266, 357, *340, 419, *363, *394
Tests, High-speed-steel. 67
Tests, Intercooler. H. V. Haight. *271
"Tests, Locomotive." W. F. M. Goss. †128
Tests of bearing metals. Melvin Price. *505, *535
Tests of Curtis turbines, Marine. 224
Tests of punch-stripping force. *543, *713
Tests of White motor car. 780
Tests of wood—Resistence to shock. 829
Tests—Paper by F. W. Taylor on metal cutting; remarks on Manchester tests; A. S. M. E. discussion 774, 820
Tests, Purdue locomotive—High steam pressures. W. F. M. Goss. 808
Tests, Ship-resistence—Experimental tank. *449
Tests, Watertown-arsenal low-temperature steel. 203
Tester, Level-glass. *18
"Testing and Specifications for Cement, Standard Methods of." A. S. T. M. †95
Testing forgings by breaking. 817
Testing laboratories, Material. Univ. of Penn.'s *532, *601
Testing, Lathe. Dean, Smith & Grace's. *295
Testing machine, Old Welsh. 284
Testing machine, Purdue impact. Hatt and Turner. *378
Testing Materials, Am. Soc. for—Corrosion. 49
Testing, Oil. 79
Testing plant, Report on fuel. †612, †715
Testing precision springs for traction dynamometer. *704
Testing sprocket chain. F. A. S. *828
Testing that tests; Am. Soc. for Testing Mat; locomotive-spring surging test; machine tools, etc. 64
Textile machinery at Milan exhibition. 332
Thermit welding. George Kelley. 493
"Things that are Usually Wrong." John E. Sweet. ‡195
Thinker, Worker as a. 93, 241, 251, 484, 705
Thread. See "Screw," "Worm," "Tap," "Hob."
Thresher patents and monopolies. 356
Throating dies with end mill. A. B. Ginner. *220
Tickets, Workmen's time—Taylor system. *761
Timber in Canada, Shortage of. 565
Timber tests. 189, 531, 829
Time estimating by slide rule. *804
Time-keeping outfit, Taylor system. *761

PAGE

Time-keeping system, Le Blond. W. T. Harris. *312
Time on patterns, Saving. J. L. Gard. 691
Time recorder, Mechanical. Bristol Co.'s. *620
Time-recorder type-wheel tools. *12
Time-tables, Russian railway. 682
Time, Working. Entropy et al. 646, 378
Tin alloys, Friction of. *535
Tin plate, Patterns made of. *117
Tire mill, Heavy Bertram (Niles-Bement-Pond.) *66
Tires, Automobile. W. H. Booth. 685
Titles for drawings. G. E. Flanagan. *605

TOOL.

See also "Machine tool." "Press," etc.
—Apprentices, Provision of tools for. 669, 818
—Box tool, Finishing, Garvin Machine Co.'s *163
—Box tool for automatic. W. Loach. *28
—Box tool, Pointing. Anthony. *680
—Buttons, Tools for turning pearl. 382, 543
—Cases, Tool. Univ. of Penn.'s. *529, *530
—Chest, Machinists' tool. Pedro. *710
—Cutlery, American demand for British. 637
—Cutting metals, Art of. F. W. Taylor—Record of experiments, remarks on Manchester tests, discussion by A. S. M. E. 774, 820
—Cutting-off tool, Triple. H. E. R. Manbrand. *744
—Diamond tools, Brazing and lapping black. H. E. R. Manband. *86
—Diamond turning points, Black. T. L. Dickinson's. *101
—Die, Manufacture of Ideal—Jigs, fixtures, chucks, nurling tool, keyway broach, gang of chaser-blank cutters, etc. *443
—Drifting ends of milled keyways, Tools for. J. Price. *746
—Facing tool, Deep. M. H. Ball. *440
—Fillets, Tool for machining large. Burt Skellan. *158
—Forming tool, Arbor for making gear-cutter. H. E. R. Manbrand. *154
—Goose-neck finishing tool. H. E. R. Manbrand. *748
—Holder, Duplex lathe-tool. Carroll Ashley. *221
—Holder for miller, Boring-tool. H. E. R. Manbrand. *23
—Holder, Multiple planer-tool. H. E. R. Manbrand. *747
—Holder, Radius cutter and. O. G. Simmons. *319
—Holder, Tool. Carr Bros'. *326
—Indexing and numbering tools, Method of. L. A. Murray. *800
—Jig at works of Landis Tool Co. and its special tools, Large boring and drilling. H. F. Noyes. *141
—Knife-edge tools. C. W. Tucker. *58
—Lathe and planer tools, Correct shape of. F. Rattek. *283
H. Cameron. *417
—Marks on bearing, Direction of tool. 772
—Nurling tool, Adjustable. W. Maddison. *546
—Paper and rubber, Turning and boring. *440, 616
—Planer-tool action. H. I. Hannover. *193
—Planer tool on return stroke, Scheme for lifting. Artebe. *819
—Post, Improved tool. F. Rattek. *614
—Press tool. See also "Press."
—Press tools, Keeping track of. T. Benson. 83, 417
—Rack for pipe tools, etc. *189
—Radius tool for work on punches. *438
—Rifle and pistol barrels—Tools for rifling, boring, chambering. *351, *679
—Rod welded on twist drill, Tool for turning small; a threading tool. W. L. McL. *711
—Segment tools for forging ring. *159
—Setting automatics. 59, *215
—Shaper, Keyseating tool for. Herman Jonson. *187
—Shop tools and methods—Jig work, drilling holes in rings, etc. F. J. LeCard. *50
—Shop tools and methods—Turret-lathe tool for shallow recesses; spring to hold cutter; combined filing and drilling jig; making V templet. F. J. LeCard. *305
—Small tools—Flexible bolt, pipe wrench, ratchet wrench. Patterson, Gottfried & Hunter, Ltd.'s. *854
—Steel business, Some demands of tool. 520
—Steel, High-speed—Uses, cost of tools, special conditions, drilling, power, speed, testing etc., by W. T. Sears; milling and jaw-threading cutters, hardening etc., by Eugene Childs. 67
—Steel, Manufacture of tool. E. T. Clarage. 573
—Stock-taking tools. A. P. Press. *122
—Tool-room estimates — Information wanted. 773
—Tool room, Open door in the; tool checking system. Entropy. 317
—Tool-room practice, Russian. 633
—Tools in old numbers of paper. 643
—Tube-expanding and flaring and tube-sheet-recessing tools, Lovekin. *258

PAGE

—Type-wheels, Tools for machining brass —Gages; cross-slide tools; tool-grinding fixture; making expanding screw-machine chuck, cutting T-slots, grinding jaw-holders; high-speed steel, wear of tool, etc. *12
—Use and abuse of tools. M. H. Ball. 29
Torpedo, Speed of gasolene. 99
Tower, Metropolitan Life's proposed. 432, 578
Townsend, Death of Fitzhugh. 824
Tracer, Eliminating the. E. P. Chandler. 123
F. H. Neely. 222
Entropy. 386
Tracing cloth, Bond paper vs. W. H. Bradley. 851
Tracing cloth, Cross-section. 799
Tracing cloth with both sides dull. D. T. R. 249
(Using fuller's earth.) R. S. Hoyt. 350
American Tracing Cloth Co.'s. 357
Tracings, Girls to make. M. MacMichael. 735
Trade. See also "Tariff," "Business."
Trade—Consular criticisms. 324
Trade, Consular report on Egyptian. †417
Trade—Export mistakes. 33
Trade, Foreign. F. C. C.—South Africa, Turkey, Egypt. 31
—South African tariff, East India, German industrial conditions. 243
—Finland, Spain, Bolivia, Argentina, Australia, Egypt, Norway, Mexico. 327
—Bolivia and Russia. 447
—American demand for British cutlery; what to expect when home trade declines; packing goods; standardization of parts. F. C. C. 637
Trade—Imports and exports classification. 325
Trade increase in Germany, Machinery. 492
Trade—Laundry machinery for Germany. 846
Trade—Machinery in India. 631
Trade-mark act, New. 65
Trade-marks in Turkey. 511
Trade—Nat'l supply and Machinery Dealers' Asso.—Henry Prentiss on increased cost of selling; papers by F. H. Brown and C. A. Clark. 491
Trade, Frank G. Vanderlip on foreign. 683
Trade school. See "Education."
Trade statistics, Automobile foreign. 374
Trade—The attitude of Japan. 455
Trade, 1905 and 1904, Philippine. 79
Trades, Wages and hours in various. 501
Transformer to low voltage, Vindex. 622
Translating technical words. Dixie. 644
Translucent, Making drawings. 123, 222, 387
Transmission dynamometer, Improved. W. F. Durand. 787
Tresca's investigations. H. I. Hannover. *189, *211
Triangle, Combination. E. W. Bowen. *248
Artebe. *485
Trigonometric functions with slide rule. 92
"Trigonometry Simplified." C. C. Maison. †128
Trinity building plunger-elevator test. 785
Trolley, I-beam. Franklin Moore Co.'s. *551
W. Hoy Bradley. *773
Trolley wheels, I-beam. C. D. King. *745
Trolley, Shop injured by opposition to. 783
Trough, Pickling. W. H. Cook. *421
Truck, Traveling—Experimental ship tank. *450
Truck with storage battery, Baggage. 326
Tube cutter. W. Maddison. *319
Tube ends, Upsetting boiler. A. Z. *55
Tube-expanding and flaring and tube-sheet-recessing tools, Lovekin. *258
Tube, Flow of fluids in Venturi. E. P. Coleman. 785
Tube frauds, Alleged navy boiler. 651
Tube, Moody's method of reducing readings of Pitot; comparison with weir. W. M. White. *175
Tube, Pitot; Venturi meter, etc.—Flow of gases. *369, 407
Tube systems in machine shops, Pneumatic. 356
Tubes, Experimental showing difference in temperatures of boiler. C. T. Porter. 830
Tubes to collapse, Resistance of. Carman and Carr. *763
Tubes 3- to 10-in. diam., Collapsing pressures of bessemer-steel lap-welded. R. T. Stewart. *44, *764
Tungsten, Carbon and—Tool steel. 575
Tunnel, Building Porfirio Diaz. 753
Tunnel model at Milan, Simplon. *270
Tunnel, Notes on Simplon. 130, 327, 410
Tunnel, Ventilating Gallitzin. 97
Tunnel under Capitol hill, Wash. 563
Tunnel ventilation, Boston. H. A. Carson. 784
Tunnels under Chicago river, Lowering. 465
Turbine at Shawinigan Falls, Weir with 6000-h.p. Morris. *178
Turbine characteristics, Steam. Hans Holzwarth. 779
Turbine invention denied, Sale of steam. 389
Turbine, Marine applications of Curtis steam. C. G. Curtis. 224
Turbine practice, American and Swiss water. 194
Turbine rings, Broaching water-meter. *247
Turbine steamer "Governor Cobb." 658
Turbine vessels built at Roach's. 128, 163
"Turbine Water Wheel Tests and Power Tables." R. E. Horton. †854
Turbine with volute casing, 10,500-h. p. Built by I. P. Morris Co. for Shawinigan falls. W. M. White. *170, 194

PAGE

Turbines, Gerald Stoney on recent advances in steam; turbine blowers. 602
Turbines, Steamers using steam. 11, 35
Turkish patent law. 437, 511
Turning. See also "Lathe," "Boring," "Facing," "Screw" (sub-entry "Screw machine.)
Turning and boring machine. C. T. Porter. 607
"Turning and Boring Tapers." F. H. Colvin. †648
Turning crank-shaft on drilling, etc., machine. 102
Turning—Cutting screw without lathe. *94, 280, 354
Turning machine, Lassiter's locomotive-bolt. *128
Turning mill, Macchi & Passoni's vertical. 333
Turning millstones. W. L. McL. 708
Turning points, Black-diamond. *86, *101
Turret. See "Lathe," "Screw" (sub-entry "Screw machine), "Forming."
Twist fixture, Swaging machine quarter. *208
Type beds, W. S. Huson on planing. 777
Type-wheels, Tools for machining brass. Edw. Snyder. *12
Typewriters, Spanish duty on. 149

U

Union labor,. S. B. Donnelly on. 684
Union Special Machine Co.'s present. 851
United States Steel Corporation. 520
United States Trade Reports fraud. 227
University and industrial discipline and methods, Comparison of. F. W. Taylor. 628, 818
University of Penn. See "Pennsylvania."
University, Technical school and. W. H. Burr. 532
Upsetting boiler-tube ends. A. Z. *55

V

Vacation camp, N. C. R. employees'. *361
Valve arrangement, Locomotive with unusual. 331
Valve, C. T. Porter's regulating. *335
Valve for water service, Scraping. 750
Valve arrangement, Locomotive with un-
Valve gears of Jacobson gas engines. *516
Valve seats, Pump—Deep-facing tool. *440
Valve—Sickels' trip cut-off. 185
Valve stems, Demanding old. W. Osborne. 281
Valves, Channeling of. 295
Valves are tested, How much. 268
Valves for "Adriatic's" engines. 186
Valves, German air-compressor. *103
Valves, Removing gas-engine exhaust. W. Alton. *90
Valves, Setting locomotive. Alfred Prince. 415
Van Boeckel, Louis, artist blacksmith. *721
Vanadium in steel manufacture, Use of. B. E. D. Stafford. 469, 453
Vanadium-steel alloys. 134
Variator, Speed. See "Speed," "Drive," etc.
Vault for storing tools. 801
Velocity of gases—Small pressure differences. *868, 507
Vents, Wax core. *427
Ventilation of Boston subway, etc. H. A. Carson, C. H. Churchill, L. H. Woodbridge et al. 784
Venturi meter; flow of gases. *369, 407
Venturi tube, Flow of fluids in a. E. P. Coleman. 785
Verein Deutscher Ingenieure. Henry Hess. 89
Vibrating tachometer. *507
Vise, Clamps for milling. A. M. A. *29
Vise, Driller. Cincinnati M. T. Co.'s. *458
Vise, Reed patent double-swivel. Fulton Machine & Vise Co.'s. 823
Vise, Removing delicate work, using hand. *153
Vise, Special table—High Duty saw. *716
Vise, The Pittsburg. *357
Visitors in the shop, Permitting. H. L. Whitemore. 751
Volumes of solids—Polar planimeter. *106

W

Wage, The advancing. 682, 663
Wages and industrial conditions, Italian. 210
Wages and salaries, English draftsmen's. 87, 355
Wages at Lynn, Apprentices'. 838, 852, 781
Wages, Apprentices'. 669, 819
Wages, Gold, prices and. 255, 51
Wages in Russia; wages books. 632, 659
Wages in various trades in U. S. 501
Wages increase, Yale & Towne's, etc. 842

PAGE

Wages of Government employees, Computing. 148
War influence requirements of peace, Demands of. Pilgrim. 81
Warner & Swasey Co. shop notes. *17
Warner and Swasey as amateur lecturers. 822
Warren, Death of Benjamin H. 592
Warranty on Huntington mill, Implied. 811
Warranty, Whether certain blue-print constituted. 572
Washers for checking nuts. *214, *514
Washers, Grinding fixture for bronze. M. B. F. *60
Washington, Balt. & Ann. R. R. equipment. 638
Washington, University of. 189
Watch case as a mirror. Pedro. 710
Watch making, Precision cams for—South Bend Watch Co.'s. Artebe. *488, *613
"Water, Analysis and Softening of Boiler Feed." E. Wehrenfennig. †492
Water by compressed air at Presall, Lancas., Raising—Union Alkali Co.'s works. Jas. Kelly. *203
Water-closet, Shop. *22
Water finding. 549, 552
Water-leveling method; leveling planer. 635, 773
Water meters, Use of. 37, 226
Water of condensation; superheated steam. 389
Water on copper pipes, Effect of salt; protection. A. H. Nourse. *579
Water power, Italy's dependence on. 109
Water pressures—New method of reducing Pitot-tube readings. *175
Water, Storage of coal under. 398
Water turbine, Large Morris. *170, 194
Water-wheel casting in place, Machining. *82
Water wheel, Draft-tube of turbine. 167
"Water Wheel Tests and Power Tables, Turbine." R. E. Horton. †854
Wattmeter-frame punchings, Punches and dies for. R. A. Almond. *743
Wax core vents. *427
Wealth, Mr. Carnegie on. 820
Webb, Francis W.; his bequests. 32, 129
Wedge action. H. I. Hannover. *340, 419
Wedges, Boring-bar-cutter; clamp for driving them, etc. *246, *351, *358, *417, *544, *642, *675, *770, *815
Weighing, Antiquated spelling and. 549
Weighing tanks, Univ. of Penn. *599
Weight of beams—Polar planimeter. *76
Weights and measures and the metric system, Our present. H. R. Towne with A. S. M. E. discussion. 789
"Weights and Measures and the Metric System, Outlines of Evolution of." Wm. Hallock. †99
Weights and Measures Association, British. 483, 671
Weights and measures, Commission on. 37
Weights and measures in England. 33, 549
Weights of steel and iron plate, Schedule. Centrode. 318
Weights of steel sections. 160
Weir and Pitot-tube comparison; weir at Shawinigan falls. W. M. White. *175
Weir tanks, Univ. of Penn. *598
"Weld" seam for range boilers, "Cold." *118
Welded forgings, Incident of. Entropy. *817
Welding, Thermit; locomotive work. G. Kelly. 493
Wells, Air-lifting from. J. Kelly. *203
Wells, Magnetic. 138
Wesson, Death of Daniel B. 259
West shop notes, Middle. *17
Westinghouse shops, Canadian. F. A. H. 564
Wheel. See also. "Fly-wheel," "Grinding."
Wheel, Arc-measuring. A. McAlpine. *29
Wheel gages misused. C. T. Porter. 182
Wheel grinder, Norton car-. *411
Wheel, Molding heavy balance. J. A. M. *42
Wheel press, 90-inch Niles 600-ton hydraulic. *420
Wheel, Shop work that suggested Ferris. 567
Wheel with level, Centering and truing. *17
Wheels, Automobile; springs. W. H. Booth. 685
Wheels, Chucks for turning hand. W. A. *318
Wheel, I-beam-trolley. C. D. King. *745
W. H. Bradley. *773
Wheels, Minimizing shrinkage stresses in balance. W. Osborne. 27, 359
Geo. F. Maddock. 160
Wheels, Motor-vehicle—Speed diagram. *513
Wheels on planer, Hand. Entropy. 386
Wheels, Tools for machining type. *12
White motor car, Steam plant of. 780
Whitney Mfg. Co., Shop of. 713
Willans & Robinson's, Metric system at. 127
Wind pressures on buildings. 367
Winding long springs. J. Bertram. *250
Winding shop, Belgian electrical works. *375
Windmills, Australian demand for American. 571
Wire-drawing, Theory of. *245
Wire insulated by oxide, etc., Aluminum. 693
Wire, Making springs of iron fence. W. L. McL. 514
Wire, Packing cylinder head with. 442
Wire-ring substitute for shoulder. *213
Wire rope. 824
Wire springs, Helical. F. D. Howe. 808
Wiring a House. Herbert Pratt. †389

PAGE

Wisconsin Univ. correspondence dep't. 853
Wives of workingmen go into factories and shops? Shall the. 490
Women's labor, Doctor Patten on. 490
Wood to shock, Resistance of. 829, 531
Wood-working machinery—Journal bearings. 485, 645, *675, 679, *812
Wood-working shop, Univ. of Penn. *528
Woods for gas-engine cylinder patterns. *431
Wooden bearings, Instances of. 355, 419, 643
Wool, Lead. 209
Words, Manufacturing code. C. R. Harris. 815
Words, Translating technical. Dixie. 644
Work, Doing worthless. C. B. Carter. 23
E. R. Douglass. 152
Nemo. 315
Entropy. 386
Pessimist. 440
(Workmen's ideas, etc.) E. T. Strong. 579
(Belt sliding; special rigs; shop systems, etc.) W. L. Hardy. 582
(Not doing worthless work—Adjusting pulley.) C. E. H. 748
(Waste by scrapping; scraping water valves; mistake in keyseating; faking.) A Mere Turner. 750
Work, Hours of—Proper, nominal and actual; congenial occupations; recreation; reducing time, saving expense, etc. Entropy et al. 646, 378

PAGE

Work in various trades, Hours of. 501
Work, Some hard. W. Osborne. 799
Worker as a thinker. Entropy. 93, 241, 251, 484, 705
Working hall, Milan. *269, 332
Workingmen go into factories and shops? Shall the wives of. 490
Workmen, Russian. 603, 632, 659
Workmen, To provide supply of skilled. M. W. Alexander. 837, 852, 781
World's Fair at Seattle in 1909. 810
Worm, Broaches for key of. J. J. Siebert. *807
Worm contact—Theory, friction tests, etc. R. A. Bruce. *623, *664
Worm-gear design. R. A. Bruce. *144, *179, *670
A. M. Sosa. 286
Worm gearing, Power transmitted by. A. Montague. 55
Worm step bearings, Pressure on. John E. Sweet. 851
Worm-wheel hobs, Flutes in. H. I. C. and O. J. Beale. 487
Worms to diametral pitch, Cutting. R. A. Niven. *190
Worthless work, Doing. 23, 152, 315, 386, 440, 579, 582, 748, 750
Wrecked and taken back, Lathe. 756
Wrench, Bemis & Call steel-handled monkey. *459

PAGE

Wrench, Large new Coes monkey. 848
Wrench, Pipe, Patterson, Gottfried & Hunter, Ltd.'s. *854
Wrench, Ratchet. Patterson, Gottfried & Hunter, Ltd.'s. *854
"Wrong, Things that are Usually." John E. Sweet. †195

Y

Yale & Towne plant wages increase. 842
Yard from meter bar, Deriving. *547
Year, Last of the; the new. 852
Yielding, Figures of. *363
Yoke, Arc milling on a. *732
Young Men's Christian Asso. 610

Z

Zinc sheets and lead percentage. 286
Zinc, Uncommon metallic impurities in. 342